THE IRON TRADE REVIEW

VOLUME XXXV. CLEVELAND, O., FEBRUARY 13, 1902. NUMBER 7

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Each week adds to the strength of the iron market and accents the inadequacy of pig iron and steel making capacity to supply the country's present demands. The course of the market in the past week and the statistical position of pig iron on Feb. 1 tell the same story of prodigious consumption beyond all record, and of production still lagging behind. Statistics of pig iron output in January and of stock reductions between Jan. 1 and Feb. 1 point to consumption in the first month of the year at the rate of 18,000,000 gross tons a year, while blast furnace capacity active on Feb. 1 represents an output at the rate of about 17,600,000 tons a year. But we are not sure even of this inadequate capacity, the severe snowstorms of last week having again reranged railroad operations so that many furnaces were compelled to bank for a day or two for lack of coke. In the Valleys and the Pittsburg district this interruption is estimated to have cut down the pig iron output by 5,000 tons. Conditions are better this week, but the ease with which the trade can be disturbd is still its most marked feature. Both pig iron and steel have advanced in the week, and buying of the former has been particularly heavy in the Chicago district. A 20,000-ton transaction in malleable pig is reported there and one for 10,000 tons, in addition to other round lots. The demand for basic iron is not so strong as in the preceding week, but the heavy additions to basic open-hearth steel capacity in the past two years are telling not only on the basic pig iron market, but upon that for melting scrap. Foundry iron is advancing under good buying for the second half. Small foundries that buy from month to month are likely to be pinched by the scarcity of iron for delivery in the first half which has already developed. Many buyers are still holding off on contracts for the second half, while others have bought freely. One estimate based on careful inquiry is that two-thirds of the foundry iron production for the year is now under contract. Southern producers, with no formal announcement of an advance, are now selling at $12.50, Birmingham, for No. 2, and a number of Ohio furnaces have advanced quotations to $16.50 at furnace for No. 2. Since Dec. 1 the advance in foundry irons has been $1.50 to $2, and for high-silicon irons, $2.50. The situation in Bessemer and basic irons is increasingly strong, and the probability that the United States Steel Corporation will be in the market as a buyer for the second half before the end of the first quarter, is already being canvassed. The scarcity of steel is more marked. Bessemer billets are nominally $29.50 at Central Western mill, but independent sheet mills and rod mills which did not buy early last fall are facing a hard condition. Independent sheet manufacturers who are to meet again at Pittsburg next Tuesday have before them a proposal to buy 100,000 tons of sheet bars abroad. Finished material still resists the upward pressure from the raw material market, but advances, particularly in structural material, would not be difficult. The larger structural mills will not follow the action of the two Eastern mills in putting up prices $4 a ton, though naturally additional tonnage will be turned westward. Inability to get promises of the required deliveries of steel shapes has put off some vessel work at lake yards, and in the Chicago district severa office building projects are held up because the mills cannot engage to deliver steel before late summer. The fact that foreign shapes are of much heavier section, added to the high cost, ton for ton, will probably prevent importations. The Louisville & Nashville Railroad has placed 30,000 tons of rails with an English mill, for delivery at Pensacola. The Mexican Central, on the other hand, is reported to have placed 50,000 tons of rails on which deliveries are well distributed, with the Maryland Steel Co.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Feb. 12.

The market in both raw and finished material continues to show increasing strength and the scarcity of billets, sheet bars and pig iron is growing more pronounced daily. So firm has the pig iron situation become that requests have been sent to the mill managers of the plants of the United States Steel Corporation to make out their requirements of pig iron for the last half of the year, which would indicate that the tonnage of the big combine in Bessemer, forge and basic will be covered within the next 60 days. This step would never have been taken but for the fact that there is every indication of a shortage of pig iron on July 1, and that the large tonnage of iron that should have been delivered the first half of the year will run into the second half. The merchant furnaces in the Valleys have only begun to make shipments on January iron, nearly all the furnaces being from five to six weeks behind on deliveries. To make matters worse the coke situation is again hampering the operation of the furnaces, no less than fourteen being banked one day during the latter part of last week. It is estimated that production at the merchant furnaces and those of the National Steel Co. was curtailed to the extent of 5,000 tons during the week, and while coke shipments are somewhat better this week, a number of furnaces are still banked.

The shortage of motive power continues to prevent the railroads from moving thousands of tons of finished material already loaded onto cars in the yards of the mills in this district, and it is estimated that fully 75,000 tons of finished material are awaiting shipment at this writing. Until motive power is greatly added to there is little possibility of relief.

During the past week the Louisville & Nashville Railroad placed an order for 30,000 tons of rails with English mills, the rails to be delivered at Pensacola, Fla. The mills in this country could not take care of this order on account of the deliveries specified. The Mexican Central Railroad on the other hand has placed an order with the Maryland Steel Co., at Sparrows' Point, Md., for 50,000 tons of rails. The deliveries however, are stretched over a considerable period. All the rail mills are several months behind on specifications and there is little indication at present that the mills will be able to catch up before the end of the year.

In structural material, contracts calling for 20,000 tons of material were placed with local mills during the week. The structural situation continues to grow in strength every week and there is every indication that much building will be delayed during the spring and summer on account of the failure of mills to make deliveries. It is not probable on the other hand that foreign material will be imported for the reason that foreign sections differ materially from those specified by Amer-

ican architects and rolled by American mills. The sections abroad are much heavier, and it is stated that the steel used for structural work in Germany, whence importations would probably come, would not meet requirements in this country.

Another meeting of the independent sheet manufacturers will be held in this city next Tuesday for the purpose of perfecting their organization. The report of a committee will also be heard at that time on the advisability of importing about 100,000 tons of sheet bars, to tide over the sheet mills until the steel situation becomes easier, or the steel producing capacity of the sheet mills can be increased. The use of German sheet bars has had a setback to some extent for the reason that the finished material from this product is not equal to that from sheet bars produced in domestic mills.

The shafting manufacturers renewed their agreement at a meeting held in this city last week and prices were slightly advanced. For fully six months no agreement has existed, but now that the market is stronger and a better demand exists there is no doubt that prices can readily be maintained.

PIG IRON.—Sales of Bessemer during the past week for delivery the second quarter amounted to about 7,000 tons at $16.25 to $16.50 at the furnace. Sales of carload lots were made at $17 to $17.25 at the furnace, spot shipment being specified. There is little buying of foundry irons, partly for the reason that nearly all the furnaces have their output sold through the first half and partly because the foundrymen are not anxious to close too far ahead. For spot shipment No. 2 has sold at $17.25, Pittsburg, in the week. We note the sale of 100 tons at this price. Forge iron for the second quarter is quoted at $16.25 while basic is nominally held at $17.25, Pittsburg. The failure of the railroads to deliver coke has again resulted in the curtailment of production, but the deliveries of coke this week have been much better than those during the last three days of last week. It is almost certain that the United States Steel Corporation will place its order for second half pig iron requirements within the next 60 days. If this should be done a steady market would be established throughout the entire year. We make the following quotations:

Bessemer, Valley	$16 25 to 16 75
Bessemer, Pittsburg	17 00 to 17 50
No. 1 Foundry	17 25 to 17 50
No. 2 Foundry	16 75 to 17 25
No 3 Foundry	16 25 to 16 50
Gray Forge, Pittsburg	16 00 to 16 50
Chilled Basic, Valley	16 25 to 16 50
Chilled Basic, Pittsburg	17 00 to 17 25

STEEL.—Owing to the fact that there is no relief in sight for the present steel situation the independent manufacturers of sheets are considering the advisability of importing fully 100,000 tons. By concerted action of this kind it is probable that lower prices can be secured than are quoted at present by German steel producers. We cannot report any sales of Bessemer billets in the week, although offers of $29.50, Pittsburg, have been made. Open-hearth billets are held at $32 Pittsburg. Orders for about 3,000 tons of German sheet bars and billets have been placed during the week. Domestic sheet bars are held at $32.50 to $33, Pittsburg. Consumers fortunate enough to place orders for billets six months ago advise us that shipments on billets for delivery last October have just commenced. The rod market continues very strong and we note the sale of 300 tons at $35.50 per ton.

FERRO-MANGANESE.—Domestic manganese, 80 per cent continues to be held at $52.50 per ton, delivered at buyer's mill. Foreign manganese is held at $50 to $51 per ton for the same delivery.

SPELTER.—The spelter market continues easy and we quote prime western grades at 4c to 4.05c, Pittsburg.

MUCK BAR.—The muck bar market is very firm and we note the sale of 2,000 tons at $31 per ton.

SKELP.—We note the sale of 3,000 tons of sheared iron skelp at 1.85c. Grooved iron skelp is held at 1.80c while steel skelp is held at 1.70c and 1.75c.

RAILS AND TRACK MATERIAL.—An order for 50,000 tons of rails for the Mexican Central Railroad was placed with the Maryland Steel Co. during the week. At the same time an order for 30,000 tons was placed by the Louisville & Nashville Railroad with English rail makers. We make the following quotations: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $42; 12 pounds $38; 16 pounds, $35; 20 pounds, $34; 25 to 40 pounds, $32. Track material: Spikes, 2c to 2.05c; track bolts, square heads, 2.50c; hexagon heads, 2.65c; fish plates, 1.60c.

PLATES.—The plate market continues steady and prices are firm and unchanged. Mills are able to make deliveries in four to six weeks. We quote: Tank plate, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c; and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $2 extra; gages Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

PIPES AND TUBES.—In the month of January the National department of the National Tube Co. broke all previous production records. A large amount of new business has been closed by the largest producers during the present month, demand being far in excess of that of the same month last year. Discounts to consumers in carload lots are as follows:

MERCHANT PIPE.

	Blk. Per cent.	Galvd. Per cent.
⅛ to ¼ and 11 to 12 inches	61	48
⅜ to 10 inches	68½	56

BOILER TUBES.

Steel.

	Per cent.
1 to 1¾ inches	47½
2¼ to 5 inches	65½
1¾ to 2¼ and 6 to 13 inches	60

Iron.

	Per cent.
1 to 1¾ and 2¼ inches	43½
1¾ to 2¼ inches	43
2¾ to 13 inches	53

CASING.

	S. and S. Per cent.
2 to 3 inches	58
3¼ to 4 inches	63
4¼ to 12¾ inches	65

BARS.—The steel bar market continues very active and contracts for fully 20,000 tons of material have been closed during the week. On small lots as high as 1.60c is being secured by some of the mills for prompt shipment. Quotations are unchanged as follows: Iron bars 1.60c, Pittsburg, with full freight added to point of delivery; refined iron bars, 1.75c and upwards; Bessemer steel bars, 1.50c; open-hearth, 1.60; plow beams and cultivator beams, 1.50c, net; channels, angles, zees and tees, Bessemer under three inches, 1.60c; over 3 inches, 1.70c. Hoops and bands are quoted at 1.90c, full extras.

SHEETS.—Demand for black sheets shows no abatement and independent producers have no difficulty in securing from $3 to $4 per ton above the prices of the American Sheet Steel Co. Demand for galvanized is not so strong, however. Quotations to consumers are as follows: Nos. 10 and 12, 2.40c to 2.50c; 14 and 15, 2.50c to 2.60c; 16, 2.60c; 18 and 20, 2.70c to 2.80c; 22 and 24, 2.80c to 2.90c; 26, 2.90c to 3c; 27, 3c to 3.10c; 28, 3.10c to 3.20c; 29, 3.25c to 3.35c; 30, 3.35c to 3.45c. Galvanized sheets are quoted at 70 and 5 and 75 off in carload lots; less than carload lots, 70 and 70 and 5 off.

STRUCTURAL MATERIAL.—Contracts calling for fully 15,000 tons of structural material for bridges in this city and vicinity and local buildings were placed last week. Outside contracts amounted to fully 5,000 tons. While two Eastern mills have advanced prices $4 per ton the agreed prices remain unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

WIRE AND WIRE NAILS.—The wire and wire nail market continues in a healthy condition and we are advised that demand is much better than for some time. Our quotations follow: Wire nails in carload lots are quoted at $2.05 per keg, while smaller lots are held at $2.10 to $2.15; plain wire $2 in carload lots and $2.10 in less than carload lots to retailers; galvanized wire $2.40 in carload lots; polished staples $2.20 and galvanized staples $2.60; painted barb wire $2.60 and galvanized $2.90. These prices are quoted on a Pittsburg base plus the actual freight to destination. Cut nails are held at $1.95 in carload lots and $2 in less than carload lots, Pittsburg, plus freight to destination.

MERCHANT STEEL.—At a meeting of the shafting manufacturers held here last week the shafting agreement was renewed and prices were advanced. Turned, cold rolled and ground shafting is quoted at 55 off in carload lots and 50 off in less

than carload lots. We quote as follows: Tire steel, 1.70c in carload lots and 1.80c in less than carload lots; toe calk, 1.95c to 2.05c; sleigh shoe, 2c to 2.25c; machinery steel, 1.50c; smooth machinery steel, 1.75c. Tool steel, 7 cents and upwards.

OLD MATERIAL.—Demand for old material on the part of open-hearth steel manufacturers continues strong and a number of the mills are covering requirements for the second and third quarters. We revise quotations, gross tons, as follows: Heavy melting stock, $17.50 to $17.75; steel rails, $17 to $17.25; busheling scrap, $13.50 to $14; No. 1 wrought, $18 to $18.50; iron rail, $22.50 to $23; cast borings, $9 to $9.25; cast scrap, $15.75 to $16.

COKE.—Both furnace and foundry coke for spot shipment is commanding high prices and we note the sale of small lots of Connellsville foundry coke during the past week at $3 per ton. On running contracts foundry coke is held at $2.75 per ton and furnace at $2.25. Outside coke is held at about 25 cents per ton less. For the week ending Feb. 1, the production of the Connellsville region, according to the Connellsville *Courier*, amounted to 208,381 tons, a small gain over the production of the previous week.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
934 MONADNOCK BLOCK, Feb 11.

The heavy demand for iron and steel products continues unabated, and trading in all lines is rapidly becoming a question of supply. The actual tonnage placed in the past week has fallen off to some extent, in comparison with the figures of other weeks, but it is not because of lack of business, being due to the fact that practically all the mills and furnaces are sold up for periods varying from three to six months. The effects of the heavy consumption of last year and the fuel famine are being keenly felt at the present time, as is evidenced by the constantly increasing demand for iron for spot delivery. There is little of this, however, to be had in this market, and for what they can get consumers have to pay a fancy price. Transactions of all kinds are confined almost entirely to those that call for delivery in the third quarter, though buying for the last half grows larger daily. Trouble is again being experienced with railroads in the deliveries of coke, receipts having fallen off considerably in the past week. This is not due to lack of cars, but to the severe snowstorms in the East, which have seriously delayed traffic all along the line. The erection of several new office buildings in this city is being considered, and architects are preparing plans, but local offices of structural steel manufacturers report they will be unable to furnish material in time, as the mills are sold up for several months and are 60 to 90 days behind orders. The buying in pig iron has been active, and a number of orders ranging from 10,000 to 20,000 tons have been closed. Scrap iron is in great demand and prices are firm.

PIG IRON.—All the local offices report that they are besieged with requests for iron for spot shipment, the demand for which grows larger each week. The scarcity is most pronounced in local foundry irons and malleable Bessemer, furnaces manufacturing these grades having suffered the most by the recent fuel famine. Such consumers as are fortunate enough to get a carload for delivery within the next two or three months willingly pay a premium of $1 to $1.50 a ton. Lake Superior charcoal iron is also in great demand by malleable foundries, and sales at $20 a ton delivered at the furnace are reported. About the only iron that can be purchased in this market for delivery prior to July 1 is No. 1 soft, a small tonnage of which a southern furnace has still for sale. The buying for delivery in the last half has been heavy in the past week, several large contracts having been closed. The aggregate tonnage was augmented by a contract for from 15,000 to 20,000 tons of low phosphorus iron placed by a local car wheel interest. We quote as follows:

Lake Sup Charcoal...	$20 00 to $21 00	Southern No. 1 Soft...	$16 15 to 16 40
Local Coke Fdy. No. 1	16 00 to 16 50	Southern No. 2 Soft...	15 55 to 15 90
Local Coke Fdy. No. 2	15 50 to 16 10	Southern Gray Forge	14 65 to 14 90
Local Coke Fdy. No. 3	15 00 to 15 50	Southern Silveries....	16 65 to 17 65
Local Scotch Fdy. No. 1	16 00 to 16 50	Jackson Co. Silveries	17 00 to 17 50
Local Scotch Fdy. No. 2	15 50 to 16 00	Ohio Strong Softeners	17 50 to 18 00
Southern Coke No. 1	16 40 to 16 65	Alabama Car Wheel...	20 50 to 21 00
Southern Coke No. 2	15 65 to 15 90	Malleable Bessemer..	18 00 to 18 50
Southern Coke No. 3	15 15 to 15 40	Coke Bessemer.....	18 50 to 20 00
Southern Coke No. 4,	14 65 to $14 90		

BARS.—New business has fallen off to some extent, owing to the inability of mills to furnish material within four to six months. There is no diminution in the demand, however, and all consumers are specifying heavily on their contracts. There is a disposition on the part of some to withhold placing orders for future delivery on the plea that prices may go lower in the next few months, but all the mills report that if any change in prices is made, it will be of an upward tendency. Steel angles are very scarce, both local and eastern mills being sold up for several months. We quote iron, 1.75c to 1.85c Chicago; steel, 1.65c to 1.75c Chicago; out of store, 2c.

SHEETS.—There is a good demand all round, and mills and jobbers appear well satisfied with the outlook. We quote No. 27 black from store, 3.40c, and galvanized, 70 per cent to 70 and 5 per cent.

STRUCTURAL STEEL.—Owing to the inability of mills to furnish material within six months' delivery, new business is of much less proportions than formerly. Plans are being prepared for several new office buildings to be erected in this city, though it is hard to tell where the structural steel for these is coming from, as all the mills are fully sold up. Local yards and jobbers also report a scarcity of material, with a lively demand for such shapes as they can furnish. We quote mill shipments, carload lots, as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 6 x 6 and under, 1.75c; over 6 x 6, 1.85c; plates, 1.75c; base, tees, 1.80c; zees, 1.75c; lots from store, 2¼c to 3 cents per pound.

RAILS AND TRACK SUPPLIES.—There is no lack of inquiry for standard rails, both from steam and electric roads, but as mills cannot promise delivery before October or November, the inquiry invariably stops at this stage. Track supplies are in excellent demand, but on these mills are sold up for three and four months. We quote as follows: Standard rails, $28; light sections, $34 to $36, according to size; out of store, $40 to $44; splice bars, 1.70c to 1.80c; spikes, 2.10c; track bolts and hexagon nuts, 2.80c to 2.90c, out of store, 2.90c to 3c; square nuts, base, 2.65c to 2.75c; out of store, 2.75c to 2.85c.

BILLETS.—There is a good demand all the time, but sales are few, being confined to those that are willing to accept such deliveries as mills can make. We quote Bessemer billets, $31 to $33; open hearth, $33 to $35.

MERCHANT STEEL.—A large manufacturing concern in the East reports that the tonnage of its shipments into this field during the month of January was the largest in the history of the company, though the three previous years were all on a heavy scale. We quote mill shipments, Chicago delivery, as follows: Smooth finished tire steel, 1.95c to 2c, which can be shaded on carload lots; open hearth spring steel, 2.25c to 2.50c; sleigh shoe, 1.65c to 1.80c, flat sizes; concave and convex, 2c; cutter shoe, 2.40c to 2.60c; machinery steel, 2.15c to 2.25c, base; plow steel, 2.50c and upwards, according to quality; toe calk out of stock, 2.40c to 2.60c—on orders for carload lots and greater these prices can be bettered; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 per cent to 10 per cent higher; cold rolled shafting, carload lots, 57½ off, Chicago; less than carload lots, 55 to 55 and 5 off, Chicago.

PLATES.—The local interest reports that the demand is constantly improving, though there is not the volume of business offered as in other lines. The Illinois Steel Co.'s plate mill was off for a few days last week, the steel being turned into billets on account of the pressing demand for that material, but it resumed on plates last Sunday. Our quotations follow: Tank steel, base, ¼-inch, 1.75c to 1.85c; flange steel, 1.90c to 2c; marine steel, 1.95c to 2.10c; firebox steel, ordinary, 2c to 2.10c; special, 2.25c and upwards. Jobbers are selling from store according to size as follows: Tank steel, 1.90c to 2c; flange steel, 2.10c to 2.25c; marine steel, 2.40c to 2.50c; firebox steel, ordinary, 2.40c to 2.50c; special, 2.50c and upwards.

CAST IRON PIPE.—There is an excellent inquiry for future delivery, though heavy buying will not begin for several weeks. There is a plentiful supply of small orders for prompt shipment. Prices are firm. We quote as follows: 4-inch water pipe, $29, carload lots, f. o. b. Chicago; 6-inch water pipe, $28; 8-inch and larger sizes, $27; gas pipe, $1 per ton higher than above prices.

MERCHANT PIPE.—There is no change in the situation from that reported for several weeks. From the volume of inquiries being received, the indications are that when the season opens there will be heavy demand for material. Our quotations follow:

MERCHANT PIPE, RANDOM LENGTHS.

	Black Per cent.	Galv. Per cent.
⅛ to ⅜ and 11 to 12 in.	59.5	46.5
½ to 10 inches	67	54.5

BOILER TUBES.

	Steel Per cent.	Iron Per Cent.
1 to 1¾ in.	40	35
1¾ to 2½ in.	47½	37½
2¾ to 5 in.	57½	47½
6 in. and larger	45	40

WIRE AND WIRE NAILS.—Trade continues very heavy, and the leading manufacturer reports that its entire capacity is taken for three or four months. We quote prices as follows: Painted barb wire, carload lots, $2.75; galvanized barb wire, in carload lots, $3.05; wire nails, carload lots, $2.20; staples, carload lots, $2.30; jobbers' prices to retailers, 15 cents higher than above for carload lots, and 20 cents for less than carloads.

COKE.—As a result of the heavy snow storms in the East during the past week, the receipts of coke in this city have fallen off considerably, and some alarm is felt that a repetition of the condition of a few weeks ago will again be felt. Spot coke is in great demand, and brings from $5.50 to $6; contracts for future delivery are closed on the basis of $5 to $5.25.

OLD MATERIAL.—There is a good demand for scrap of all kinds, and prices are very firm. The shortage of pig iron has compelled mills and foundries to buy heavily, and there is a scarcity of material. The following are approximate prices in gross tons:

Old iron rails	$21 50 to $22 50	Relaying rails	27 00 to 28 00
Old steel rails, 5 ft. and up	22 00 to 22 50	Old wheels	$17 00 to $17 50
Old steel rails, mixed	14 50 to 15 00	Heavy melting steel	14 50 to 15 00
		Mixed country steel	10 50 to 11 00

The following are selling prices per net ton:

No. 1 R. R. wrought	$16 00 to $16 50	Steel Axles	$18 50 to $19 00
No. 2 R. R. wrought	14 00 to 14 50	Cast borings	6 00 to 6 50
Dealers' forge	13 50 to 14 00	Wrought turnings	11 00 to 11 50
No. 1 busheling	11 00 to 11 50	Iron axle turnings	12 00 to 12 50
No. 1 R.R. & mach. cst.	12 25 to 12 75	Steel axle turnings	12 00 to 12 50
Railway malleable	12 00 to 12 50	Stove plates	10 00 to 10 50
Country malleable	11 50 to 12 00	Old iron splice bars	16 50 to 17 00
Iron axles	21 50 to 22 00		

CLEVELAND

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING Feb. 12

There is no longer any rush of ore sales and the disposition of the balance of the output of 1902 that will go upon the market will be a matter of months. As was the case last year, most of the merchant furnaces are placing a part of their requirements now and will hold off on the remainder until later in the season. There is an evident preference for Bessemer iron on the part of furnace firms that ordinarily produce both Bessemer and foundry irons. The higher fuel cost of the higher silicon irons and the excellent demand for Bessemer iron promise to make the Valley output of foundry irons in the coming year considerably less than in former years. The high phosphorus ores, always in demand for foundry irons, are not going as rapidly this year as usual. Furnacemen in some instances are holding themselves in readiness to direct their operations later in the year into the line that shall then be most profitable.

The beginning of ore chartering has come in the past week. After a few transactions at 80 cents from the head of the lake, a large deal involving 1,300,000 tons of ore was put through by Corrigan, McKinney & Co., on Tuesday, a number of owners, in addition to vessel interests connected with the above firm tying up at 80 cents for the season. In all about 1,800,000 tons have been covered on this basis. The representatives of the United States Steel Corporation have bid 75 cents on season business. Though nothing has been done on this basis as yet, the shipping manager of the corporation states with some confidence that vessels will be signed at this figure when the time comes.

PIG IRON.—There is a steady run of business in foundry iron, the buying being chiefly for the second half of the year. Consumers are becoming more and more willing to contract for the latter half, especially where the iron is to go into their own castings, machine shop capacity being engaged well ahead. What is troubling sellers most of all is the call for iron for shipment in the first half, a good many foundries not having provided fully for their requirements. It is certain that some of these will not get the iron they want, and the situation will bear hardest upon the smaller foundrymen whose needs are two or three carloads a month and who buy from month to month. Prices of foundry iron are stronger. Southern sellers are now on a $12.50 basis, Birmingham. Valley furnaces are more generally asking $16.50 at furnace for No. 2 foundry for second half. Coke troubles have been serious again in the Valley and Pittsburg districts, production being cut down on this account the past week. Forge iron is strong at $15.50 to $15.75 for second half. Lake Superior charcoal iron is selling freely at $20 for the second half, producers being practically sold up for the first six months. Bessemer iron is scarce and very strong. We revise quotations as follows:

Bessemer	$16 75 to $17 50	Scotch No. 1	$17 25 to $17 75
No. 1 Strong F'dry	17 25 to 17 75	Scotch No. 2	16 75 to 17 25
No. 2 Strong F'dry	16 75 to 17 25	Gray forge, Valley	15 50 to 15 75
No. 3 Foundry	16 50 to 16 75	LakeSuperior charc'l	20 00 to 21 00

FINISHED MATERIAL.—The demand as indicated by the daily mails of jobbing houses is well sustained. No large contracts have been placed in the past week apart from several thousand tons of structural steel taken by local buyers. Mills are unable to take care of the small trade in shapes and this goes largely to concerns carrying stocks and cutting to length. The ability of small buyers to supply their needs in the coming building season will depend upon the sort of delivery dealers are able to secure from the mills on their contracts. Thus far the latter have not been able to accumulate stocks to the extent they would like, though this has been their aim in the quiet months of winter. One indication of the condition of the structural mills and of what is to be expected, is the laying aside of some plans for vessel building because shapes could not be had before July, though plates could be promised in four or five weeks. We quote 1.70c, Cleveland, for mill shipments of beams and channels up to 15 inches in width. From stock 2½c to 2¾c, Cleveland, is the range. Specifications on bar contracts come in steadily, but there is a lull in large business. For prompt shipment from mill 1.68½c, Cleveland, has been secured on steel in some cases, and that is the basis for forward contracts for bar iron. For bars out of stock the price is 1.80c to 1.85c, Cleveland. The sheet trade is in strong condition, and the increase in producing capacity in that line is only occasionally in evidence in the market. For forward deliveries prices of independent and consolidation mills are substantially together, but varying conditions of independent mills have made some unevenness. Mills able to make early deliveries are getting good prices. For some time galvanized sheets have not been as firmly maintained as black sheets. We continue to quote on mill shipments to consumers as follows for Cleveland deliveries: No. 24, 2.90c to 3c; No. 26, 3c to 3.10c; No. 27, 3.10c to 3.20c, with usual extras for less than carload lots, etc. Round lot quotations from store are as follows, prices depending on quantity and delivery: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.55c to 2.70c; No. 16, 2.95c to 3.10c; No. 18, 3c to 3.15c; No. 20, 3.05c to 3.20c; Nos. 22-24, 3.15c to 3.30c; Nos. 25-26, 3.25c to 3.40c; No. 27, 3.35c to 3.50c; No. 28, 3.45c to 3.60c. The above are for one pass through cold rolls. For full cold rolled the extra is .10c. Galvanized sheets are quoted 70 to 70 and 5 off list. The plate market is steady at 1.70c, Cleveland, for tank.

OLD MATERIAL.—The uneven condition at the commencement of the month has changed to a steady and heavy demand; the market strengthening in sympathy with foundry and mill irons. Prices have advanced in nearly all lines, as may be seen on comparison with quotations a week ago, to which we add 50 cents to $1. The following are current Cleveland prices, all in gross tons:

Old steel rails, rolling mill lengths	$17 50 to 18 50
Old steel rails, short lengths	16 00 to 17 00
Iron rails	21 00 to 22 00
No. 1. railroad wrought	17 50 to 19 00
Mill scrap	15 00 to 16 50
No. 1. machine scrap	14 75 to 15 50
Machine shop turnings	13 00 to 13 50
Cast borings	7 00 to 7 50
Grate bars	8 50 to 9 00
Sheet iron	9 00 to 10 00
Stove plate	10 00 to 10 50
Car wheels	16 00 to 17 00
Heavy steel scrap	16 50

CINCINNATI.

Feb. 12.

While weather conditions have affected the iron trade in some particulars, more especially in the delivery of finished

material out of store, the business that looks to future delivery has been wonderfully good. Buying of pig iron has been such as to cause some producers and handlers to wonder if their customers were not buying more than they needed. Buyers, however, declare that the element of speculation does not enter into their buying in the least; some of them cite as an indication of the straits to which they are put that they are four months and over behind in their orders. This condition they partially blame on the pig iron producers, since they have been clamoring for iron at odd times during the past year. They do not propose, if they can help it, to be caught in the same situation again, and many are buying now all the iron that they see they will need during the year.

The melting capacity in Cincinnati and this district promises to be increased instead of diminished. One large foundry is reported to have plans for doubling its capacity, and mention was made in this letter a few weeks ago of another that had bought ground and would do the same thing. A local malleable casting concern is also considering the matter of largely adding to its capacity.

A peculiar condition exists among the malleable casting manufacturers. On account of the severe competition of a number of strong concerns the price has been worked down to the point where it is lower than gray castings. This was shown in the case of a malleable foundry that is so full of business that it had not time to make some special gray iron castings for its own use last week, and let the contract to another gray iron foundry. The malleable foundry had taken a contract the day before for a large lot of castings at 2.85c and gave the order for gray castings at 4c. Manufacturers are still having a very satisfactory business. They are running their foundries closely and report a continued good business.

PIG IRON.—In the past week there has been a continuation of the buying that has been going on for months. The demand varies at times, now one grade being more in demand, and now another; but the aggregate of the orders evens up just about the same. There have not been as many large orders placed during the past week, but the small ones have made up for it. Buying of Southern car wheel iron has also continued on a large scale, but takings of basic, noted last week, have dropped off. Northern irons are perceptibly higher, and today three important Ohio furnaces that generally make the market, advanced their figures on No. 1 $18.10 to $18.35 and on No. 2, $17.60 to $17.85. It is thought that other furnaces will come up to these prices, though as yet there are some selling at figures a little lower.

Southern irons remain firm and are quotably higher as to the outside prices than they were a week ago. Some of the furnaces refuse to sell lower than $12.50, Birmingham, for No. 2, while on the other hand, a few are still quoting No. 2 at $12. It appears, however, when inquiry is made for the lower priced iron there is not much of it to be had. The following prices rule for the Cincinnati market:

Southern Fdy. No. 1	$15 25 to $15 75	Gray Forge	$13 75 to $14 25
" " 2	14 75 to 15 25	Northern Fdy. No. 1	17 85 to 17 35
" " 3	14 25 to 14 75	" 2	17 35 to 17 85
" " 4	13 75 to 14 25	Southern C.W. iron	19 25 to 19 75
So. Fdy. No. 1 soft	15 25 to 15 75	Malleable coke iron	17 35 to 17 85
So. Fdy. No. 2 soft	14 75 to 15 25		

FINISHED MATERIAL.—Prices remain the same, but the demand is very good and deliveries are not as good as they were a while back on some lines. The failure of steel bars to advance causes surprise in some quarters, it being extremely hard to get billets and the opinion being that the market ought to go up of itself, at least to a level with iron bars. It is understood that the rolling mill capacity, which is much taxed in this district, may be increased. One of the largest interests in this district is considering an addition. Prices on finished material remain unchanged. Bar iron is 1.72c, Cincinnati, and steel bars, 1.62c. Out of store both are selling at 2c. Angles are 2c; plates, 1.85c; sheets, No. 28, 3.35c to 3.40c; and No. 12, blue annealed, 2.35c.

OLD MATERIAL.—The scrap market has been quiet, but there has been a steady demand for such material as has been offering. Prices remain at the figures quoted last week:

Old No 1. Wrought Railroad, net tons	$ 15 50 to 16 00
Cast Machine and Foundry, net tons	12 50 to 12 75
Old Iron Rails, gross tons	21 25 to 21 50
Old Steel Rails, gross tons	18 00 to 18 25
Old Short Lengths, gross tons	15 00 to 15 25
Old Iron Axles, gross tons	21 00 to 21 50
Old Iron Car Wheels, gross tons	16 00 to 16 50
Stove Plates, gross tons	9 75 to 10 00
Wrought Turnings, net tons	11 50 to 11 75
Cast Borings, net tons	5 50 to 6 00

PHILADELPHIA.

Feb. 11

The scarcity of pig iron, especially at the principal consuming points, is if anything more acute. No doubt is expressed as to the genuineness of the shortage and under the enormous present consumption, together with delays likely to impede transportation facilities in one form or another, the day on which increased production will be able to afford some relief seems far in the distance. The fact stands out prominently that in spite of all that has been done there exists a general inability to keep up with requirements. No one appears to be considering the possibility of any reaction and the splendid condition in which business finds itself continues to prompt the erection of new plants and the enlargement of old ones.

PIG IRON.—Consumers are showing fear of not being able to obtain a sufficient supply of raw material. There has been a general scurrying around for iron of all grades to be delivered within the next sixty or ninety days, and where it has been possible to obtain this all kinds of prices have been paid. Consumers seem to be expecting that an easier feeling will prevail at the expiration of the next two or three months, yet prospects are not favorable for larger supplies in the near future and iron is being eagerly taken for deliveries extending throughout the year at prices based on $17 for No. 2 X foundry. While makers would be satisfied to be let alone for some time to come, they are doing what they can to protect their trade, at the same time urging their customers to confine their purchases to actual needs. On such a market as the present there is naturally so much variation in prices that definite figures are hard to give, but as near as can be ascertained quotations for Philadelphia and nearby deliveries are about as follows: No. 1 X foundry, $18 to $18.50; No. 2 X foundry, $17 to $17.75; No. 2 plain, $16.50 to $16.75; standard gray forge, $16 to $16.25; ordinary gray forge, $15.25 to $15.75; basic (chilled), $16 to $16.50; Bessemer, $19.25 to $20.25.

FINISHED MATERIAL.—From $5 to $8 per ton above regular figures is being obtained for structural material on which early delivery can be guaranteed. The demand for plates continues heavy and prices may, owing to the increased cost of raw material, be advanced slightly at any time. Some irregularities are shown in the price of sheets, caused by independent mills attempting to contract for the full capacity of their works. In a general way there is sufficient business to keep everybody fully employed and in every branch a satisfactory feeling exists. Prices are about as follows for city and seaboard deliveries: Plates, ¼-inch and thicker, 1.75c to 1.80c; bars, iron or steel, 1.62½c to 1.70c; angles, 1.75c to 1.85c; beams and channels, 1.75c to 1.85c.

OLD MATERIAL.—The scrap market remains firm, with apparent scarcity in several lines tending towards higher prices where prompt delivery is involved. Bids and offers are about as follows for deliveries in buyers' yards: Choice railroad scrap $21 to $21.50, ordinary light scrap $13 to $13.25, machinery cast $14.50 to $15, heavy steel scrap $19 to $19.50, old iron rails $21.50 to $22.50, wrought turnings $13.50 to $14.25, cast borings $8 to $8.50, old iron axles $25 to $26, old steel axles $22 to $22.50, old car wheels $17 to $17.25.

The American Brake Shoe & Foundry Co. was incorporated in New Jersey on Jan. 29, with $3,000,000 capital stock. It has taken over the Sargent Co., of Chicago, and the Ramapo Foundry Co., of New Jersey. The Ramapo Foundry Co. is an offshoot of the Ramapo Iron Works, having taken over the foundry business of the latter company in order to give that company more facilities for operating its switches and frog department. The officers of the American Brake Shoe & Foundry Co. are: W. W. Snow, chairman of the board; W. D. Sargent, president; Otis D. Cutler, vice-president and general manager; H. K. Gilbert, treasurer; E. J. Snow, assistant treasurer, and R. J. Davidson, secretary. The New York office will remain at 26 Cortlandt street.

The Cuyahoga Stove Repair Co., of Cleveland, has purchased land at Union St. and the Wheeling & Lake Erie Railroad, and will erect a foundry. The main building will be 100x125 feet.

THE IRON TRADE REVIEW

Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

PUBLISHED EVERY THURSDAY BY

THE IRON & STEEL PRESS CO.,

ROSE BUILDING, CLEVELAND, OHIO.

G. H. GARDNER, President and Treasurer.
JOHN A. PENTON, Vice-President.
A. I. FINDLEY, Secretary.

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CHICAGO : 934 Monadnock Block, GEO. H. GRIFFITHS, Manager.
PITTSBURG : 429 Park Building, A. O. BACKERT, Manager.
NEW YORK : 150 Nassau St., D. C. WARREN, Manager.

Subscription, $3.00 per annum. To Foreign Countries, $4.00.
Advertising Rates Furnished on Application.

The Cleveland News Co. will supply the trade with THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER

FEBRUARY 13, 1902.

STEADY PRICES AND THE FUTURE.

The *Railroad Gazette* comments as follows on the recently published preliminary report of the United States Steel Corporation's officers:

In reading the wonderful report of the United States Steel Corporation one is sure to be struck by the statement of the policy of the directors in the matter of prices. That has been a policy of moderation and stability. The principle has been to keep the prices steady and not permit them to be run up under the demand of the year, and thus to encourage enterprise and the expansion of consumption and so to enlarge the market. This is the greatest single example ever seen of the application in practice of modern notions of political economy, and few who have thought much about the general subject will doubt the fundamental soundness of the principle.

The report tells us that large economies have been made in manufacturing by frequent interchange of views and of full information among the constituent companies. How great these economies are we have no means of judging, but we do know that it is the practice to assemble committees representing the different branches of manufacture by which committees technical matters are discussed. When we consider the vast territory covered, the wide diversity of conditions, and the amount of experience and ability assembled, it is fair to assume that this system of conference and mutual instruction will produce important results.

Of the effect of the price policy referred to, not only upon the earnings of the steel corporation, but upon the iron trade of the United States, time alone can give an adequate basis for a judgment. Thus far the comments upon the report have largely borne upon its relation to stock market values. The iron trade will find in it and in the policy it outlines much to assist it in taking its bearings for the future. Those who have acted as referees for the public on questions relating to the value of steel corporation securities have pointed out that what has happened in the iron trade is sure to happen again; that the alternation of extreme depressions and booms must be expected as heretofore, and that when prosperity departs and iron again drugs the market, the showing of all steel companies will differ from the present as night from day.

It is foolish to prophecy about iron, and the iron trade at large is only interested in values of steel securities as these reflect conditions in the industry; but it would seem that all forecasts that promise for the iron trade a repetition of what has been, ignore utterly the most powerful influence that has ever been exerted in our industrial history. It is almost an unheard of thing that manufacturers should resist with all their power a natural and legitimate advance in prices. Heretofore the taking of all that the market would bear, in times of special prosperity, has been justified on the ground that the reaction was sure to come, and that the unusual profits of the boom would be needed to tide over the ensuing depression. But what shall be said of the policy of refusing to ask a price that might be had? Is this not evidence of a strength greater than has ever been shown by all the pools and associations combined? Does it not suggest a power greater than any that has ever been exerted in the opposite direction? The drastic action of a pool that limits production and maintains prices, even when demand has fallen away one half, has always been our synonym for power in the regulation of prices. Now we are treated to a phenomenon almost without parallel—certainly it is unparalleled in the sphere of its influence and in the resources involved in its creation; yet with all that is admitted as to the steadying and leveling effect of the policy of resisting advances, we are soberly told that tomorrow in the iron trade shall be as yesterday.

It is now nearly a year since the United States Steel Corporation was organized. It has been a year of marvelous prosperity, and at no time has there been any test of the ability of this vast corporation to get business and to keep the iron trade from demoralization, when supply was plainly in excess of demand. While no one can undertake to say what will happen when today's conditions change, as change they must, it is the greatest presumption to assume that the sagacity and moderation that have met the problems of an unparalleled prosperity will not be present as conserving and steadying influences in the less dangerous conditions that belong to quieter times.

When the slacking up comes, we shall expect to hear more from the policy referred to in the second paragraph we have quoted above. It is only in such times that the technical staff can really give proof of its strength.

THE POSITION OF THE JOBBER IN IRON AND STEEL.

The last three years have been very important ones in shaping the position the iron and steel jobber is to hold in the future. The consolidation movement, it was thought, would greatly circumscribe his field. Another influence in the same direction was the tendency of large producers, having gone as far as possible in reducing their product to the most finished form, to cultivate intimate relations with the actual consumer, and sell direct to him, where formerly a less finished product was sold to a finishing mill.

The elimination of the jobber, however, has not been found desirable by the consolidations so far formed. The tin plate consolidation at once recognized the legitimate jobber, and through the operations of this company the field of the ordinary jobber has been widened. Buyers who formerly were comparatively large cus-

tomers of a small tin mill are now customers of a jobbing house. The sheet consolidation started on an entirely different principle, and at first sold in less than car load lots to all applicants. The dissatisfaction caused by such a course brought about a change, and the sheet company now broadly recognizes the jobber. The wire company does the same.

Iron and steel jobbing houses have shown an inclination to criticize the bar manufacturers in that they have not, through their various associations, established a system of "protecting" the jobber, as the large concerns selling sheets, tin plates and wire products have been doing. Occasionally invidious comparisons have been drawn. These are scarcely warranted in a close consideration of the facts. The recogniton of the jobber in any particular line is not a question in which the point is involved whether the producing plants are wholly independent, are more or less closely related in an association, or are consolidated into a "trust." The exigencies of the bar trade are such that close relations between the producer and the actual consumer are legitimate and desirable for their mutual benefit. Some of the consumers are very large and others are very small. There are not so many of the medium class. The trade of the smallest naturally goes to the jobber as matters now stand.

It is foolish to prophesy about iron, and the iron it much easier for the manufacturer to establish the principles upon which the jobber will be dealt with, and it is true that the consolidations have been able to put in force regulations which were of benefit to the jobber. They have been a benefit to the jobber in giving him something that was legitimately his. It does not follow that they would be a benefit to the iron trade as a whole if they gave him something that was not legitimately his, and it is the opinion of the bar manufacturers that the jobber ought not to stand in the same relation to the bar trade as he does to the wire, sheet and tin plate trades, where the distance between producer and actual consumer is greater.

AN EDUCATIONAL EXCURSION INTO THE SHOP.

In a very interesting article, one of the magazines devoted professedly to teaching the young idea how to shoot toward success, nas undertaken the discussion of machine tool matters and has collected photographs showing the product of leading manufacturers, to illustrate the text. So far the scheme has been carried out very well to all surface appearances, but in some manner the descriptive matter accompanying the half tones has not had the advantage of an editing by some one acquainted with the machine tool business. A few of these educational efforts are quoted herewith:

"The boring and turning mill turns large fly wheels and driving wheels, taking many hours to make one cut through the hard metal." "By electricity generated in a motor attached to an upright shaft the drilling machine bores through the hardest steel." "The automatic screw machine cuts small turned parts from metal rods, for watches, clocks, typewriters, etc., twenty every minute." "The forge lathe turns, with hair- like correctness, monster guns for battleships and coast defense. It performs the most gigantic tasks expected of machine tools. Mechanics call it the 'iron calculator' because of its wonderful, invariable accuracy."

These extracts are not exhaustive by any means; they are merely suggestive of the rich vein of humor the machinist may unearth in the average popular article treating upon his specialty. One of the illustrations shows a plain milling machine cutting out the teeth of a hob. The hob is said to be ten inches in diameter, and those who have had any experience in the making of these tools will be somewhat surprised to learn that the machine is "capable of making four thousand hobs every minute." A less developed propensity to believe all that some practical joker is disposed to circulate might have produced a more accurate but certainly not so amusing a contribution to the literature of the shop.

Sheet Mill Extension.

(Special Telegram.)

PITTSBURG, Feb. 12.—The new plant of the Waukesha (Wis.) Sheet Steel Co. is to be trebled in capacity. J. E. Jones, vice-president and general manager of the company, is in this city placing contracts for machinery. When brought to its full capacity the plant will have twelve mills, four galvanizing pots, a bar mill and a corrugating department.

The foundry of the Frank Kneeland plant of the United Engineering & Foundry Co. of this city is to be enlarged by the addition of a wing 100x100 feet. The melting capacity is not to be increased.

Mr. Carnegie's Epitaph.

The Associated Press, in transmitting the epitaph which Andrew Carnegie proposed for himself in his Stevens Institute speech last week made a blunder that has set the paragraphers gasping at Mr. Carnegie's astonishing candor. As sent across the country the sentence read:

"Here lies a man who knew how to get around men much cleverer than himself."

The omission of the third personal pronoun after the preposition is a startling illustration of the perversities of language.

The Toledo plant of the Shelby Steel Tube Co., is expected to shut down in the coming week to remain idle for several months. C. H. Wood, the superintendent, has resigned to become manager of the Seamless Steel Tube Co., of Detroit.

The Susquehanna Iron & Steel Co. has appropriated $300,000 for the building of a new wrought pipe plant at Columbia, Pa. It is expected that the new plant will be completed in six months. The output will be 100 tons a day. Two mills of the company are turning out skelp, much of which has been sold to the National Tube Co.

The Massillon Iron & Steel Co., of Massillon, O., manufacturers of cast iron pipe and of heavy castings for blast furnaces and rolling mills, has let contracts for the doubling of its present power plant. The engines will be furnished by the Russell Engine Co., of Massillon, O., the dynamos by the Northern Electrical Mfg. Co., Madison, Wis., and the boilers by the Erie City Iron Works, of Erie, Pa. The new equipment is expected to be in operation within the next six weeks.

It is reported that a contract has been let to a British rail mill for 2,500 tons of steel rails for frog and crossing work in the United States. The Cleveland Frog & Crossing Co. is one of the firms interested in the importation of these rails. American mills could not make the deliveries desired.

At the Carnahan Tin Plate Co.'s plant at Canton, O., the second three of the six hot mills are to be started this week, and next week the cold mills. Four hundred men are now employed.

The machinery molders of Cleveland who decided recently to ask for an increase in the minimum wage from $2.75 to $3 for a 10-hour day, appointed a committee at a meeting Tuesday evening, Feb. 11, to wait on the foundrymen and learn what they have decided to do about the demand.

MOLDERS MAINTAIN APPRENTICESHIP RATIO.

Foundrymen will be interested in the result of several votes recently taken by the Iron Molders' Union of North America. On the proposition to hold a convention in July, 1902, the vote is not yet canvassed, but returns thus far in make it certain that the convention will be held. The place is Toronto and the date July 7, 1902. No convention has been held since that at Indianapolis in 1899. The heavy expense of conventions makes them infrequent, the government of the union being largely in the hands of the executive committee. The past three years have made much history in the relations of molders' unions and foundrymen, and the rank and file of molders evidently consider that a review by a representative convention is in order.

The *Iron Molders' Journal* announces also the result of the referendum vote upon the propositions recently submitted to the union on the question of apprenticeships. The proposal to change the apprenticeship ratio from 1 to 7 to 1 to 5, with one apprentice for the shop in either case, was defeated by the overwhelming vote of 15,842 against 504 in favor. The proposal to permit members of the Stove Founders' National Defense Association, who cannot after five days' notice obtain a sufficient supply of competent journeymen molders, to increase the number of apprentices to the requirements of their business, where the presidents of the Iron Molders' Union and the S. F. N. D. A. agree that sufficient force is not at hand to do required work,—was defeated by almost as large a majority as the first, the vote being 527 in favor and 15,446 against. Proposition No. 3, which provides that molders in S. F. N. D. A. shops shall not be required to work with a helper, or "buck," and that the number of helpers shall not be increased, the object being the ultimate discontinuance of the system, was defeated, 7,433 voting in favor and 8,148 against. Proposition No. 4, empowering the officers of the union to negotiate an agreement on some other ratio of apprentices than 1 to 5, in case proposition No. 1 is defeated, was lost, 3,978 voting in favor and 12,314 against.

Warehouse Facilities of the Bourne-Fuller Co.

The Bourne-Fuller Co., of Cleveland, has recently added to the line of material which it carries at its warehouse at Coe and Lake Sts., Cleveland, a stock of all standard sizes of beams, channels, angles and tees, in long lengths, and is providing facilities for cutting to lengths when required. This is in line with the policy of expansion which this company has pursued for some time past, and plans are already laid for further improvement in these facilities. The new warehouse, erected during the past year, is one of the most complete in the Central West, covering an area of 300 by 150 feet, with railroad facilities on two sides capable of handling at one time twelve or more cars, and on the street fronts of accommodating any number of teams.

In addition to the ground covered by this warehouse, the company has recently acquired adjoining land giving yard room about 300x330 feet, on which the stock of structural material is being accumulated. A steam driven crane with 50 foot boom has been provided for handling this material, and present plans include the addition of electric cold saws and other appliances for cutting rapidly and cheaply all structural shapes. In addition to the structural material the warehouse includes a stock of sheets, bars, hoops and bands, wrought iron pipe, rivets, Norway iron, and all other material in the comprehensive line handled by this company. The portion of the warehouse devoted to sheets, hoops, bands, and such material as is easily damaged, is sufficiently heated in cold weather to provide against damage by rust. Direct connection with the Lake Shore and Pennsylvania systems is had through the "Silver Plate" switch.

Methods of Analysis for Cast Iron.

The American Foundrymen's Association committee on standardizing bureau has sent out the following circular letter to manufacturers and users of pig iron maintaining their own laboratory:

"Pursuant to instructions received at the Buffalo convention of this Association, careful inquiry has been made as to the feasibility of recommending given methods for determining the constituents of cast iron as the standards of the association. The concensus of opinion seems to be that such a standardization is a highly desirable one, but that no one method be selected. All those methods giving concordant results within the limits of commercial accuracy should be allowable. The committee would therefore request your laboratory to send to Thos. D. West, chairman, Sharpsville, Pa., any method for the determination of the total carbon, graphite, silicon, manganese, phosphorus and sulphur in cast iron, which it would recommend for adoption as standard. The literature thus received will be reviewed by chemists of national repute, and all methods known to give commercially accurate results selected for recommendation as standards. Should it be possible to secure such a selection, a great boon will be conferred upon foundry, blast furnace, and laboratory management alike, and your kindly attention and aid are therefore urgently requested."

Dedication of the New Stevens Institute Building.

Five hundred alumni and friends of Stevens Institute of Technology, in Hoboken, N. J., gathered in the new laboratory of engineering on Thursday evening, Feb. 6, for the dedication of this gift of Andrew Carnegie to the institution. Mr. Carnegie was present and made an unusually happy address, turning over the building to the trustees of Stevens Institute. In turn he was presented with a handsome silver casket as a souvenir of the occasion. The casket was the gift of the alumni of Stevens. It contained a piece of the first T rail ever made—the invention of R. L. Stevens, and rolled in 1830 at the works of Sir John Guest in Wales, under the personal supervision of Mr. Stevens. With these rails the Camden & Amboy Railroad, built and managed by the Stevens family, was laid in 1831-32.

It is announced that Mr. Carnegie has just made a gift to Stevens Institute of $100,000 for the endowment of the laboratory. The building cost $60,000.

A convention of the tube workers of the United States will be held in Pittsburg on March 13, for the purpose of organizing a national association which will become affiliated with the American Federation of Labor. The tube workers in the Eastern portion of Pennsylvania as well as those employed in the mills of the National Tube Co. are to be included in the organization. The puddlers and finishers employed in the mills in the Eastern section of Pennsylvania to the number of 5,000 have been organized into unions and these in turn are now being taken over by the Amalgamated Association of Iron Steel and Tin Workers. The association has always been weak in this section of the state. Lodges have been organized as follows: Four at Reading, Pa.; one at Douglassville, Pa.; one at Birdsboro, Pa.; two at Lebanon, Pa.; one at Pottstown and one at Catasaqua, Pa. The mills employing the men in these lodges will be requested to sign a scale for the new scale year beginning June 1.

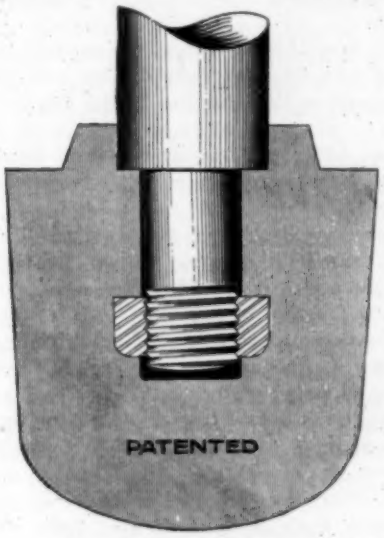
The Railway Spring Steel Co., of Pittsburg, will be incorporated this week under the laws of New Jersey with $20,000,000 capital. Half of this will be common and the remainder 7 per cent cumulative preferred. The plants that will be taken over are the A. French Spring Co., of Pittsburg; the railway spring business of the Crucible Steel Co. of America; Detroit Steel and Spring Co., Detroit, Mich.; National Spring Co., Oswego, N. Y.; the Pickering Spring Co., Ltd., and the Charles Scott Spring Co., Philadelphia. There will be no formal organization until March 1.

The National department of the National Tube Co., McKeesport, Pa., broke all previous production records in January. The output of the several departments for the month was as follows: Tube and pipe mills, 30,551 tons of finished pipe, while the best previous record was 28,882 tons; National rolling mills, 24,458 tons, against a previous record of 22,670 tons; Boston iron and steel works, 7,349 tons, against its best previous output of 5,623 tons; blooming mill of the Monongahela furnace department, 26,918 tons of metal, against its best record of 23,770; converting mill of the same department 29,044 tons, against its best record of 26,971 tons.

Wm. Swindell & Bros., engineers and contractors, Pittsburg, Pa., have been awarded the contract for the erection of six annealing furnaces and one air furnace by the Fort Pitt Malleable and Gray Iron Co., of Pittsburg. The plant will be erected at McKees Rocks, Pa.

A SCREW STOPPER FOR STEEL WORKS.

Ross & Co., proprietors of the Pennsylvania Crucible Works, 1445 Marshall street, Philadelphia, have produced a new screw stopper which is of interest to managers and superintendents of Bessemer and open-hearth steel works. It is particularly commended for its perfect points and for doing away with the necessity of making bolts which require to be slotted, beside the furnishing of a key. The burning off of



SCREW STOPPER FOR STEEL WORKS

the head of the bolt is one annoyance that is done away with, and the nut being molded in the stopper-head insures it against pulling off, and gives a solid end to the stopper. Doing away with the work entailed by the old stopper cheapens the new one in practice, though the first cost is somewhat greater.

Secretiveness Regarding Shop Methods.

It is generally understood that most manufacturing establishments in European countries are not freely opened to outsiders, but, on the contrary, it is difficult for anyone not connected with a concern in some capacity to obtain admittance under any pretext. This policy is rigidly adhered to by the largest works, notably that of Krupp, at Essen, Germany, as well as the smaller ones. So when a European shop is found which freely affords opportunity to inspect its methods of manufacture it has departed from the established policy of exclusiveness which marks the great majority.

Some years ago a leading manufacturing company of the United States established a branch factory in France for making their products. Following their general policy as to shop hospitality all who were interested in their products and manufacturing machines and methods were freely admitted to the works and special pains taken to show them the improved machinery and the special appliances developed and in use for reducing manufacturing expense. The amazement of most of the French engineers who were granted these favors is said to have only been equaled by the appreciation of, to them, unexampled courtesy. They expressed their wonder as to the policy which made public that which would have been most zealously guarded in most French shops and regarded as an asset which would be lost if divulged to the public.

That the American company mentioned have not lost prestige or business by not following a policy of secretiveness goes without saying, and if proof were needed it is only necessary to point to the volume of business now transacted by them, which is many times that of the time when the French factory was opened. The secret of their success must therefore, not lie in "keeping things dark," but undoubtedly in their policy of progressiveness which does not permit of standing still in the development of their product or of the machinery for its manufacture. It is said that this company and their allied interests spend annually not less than one-half million dollars in experiments and investigation work. Of course, the principal part they play in the development of machine tools is that of offering a ready market for any machine which increases productive capacity, and such should be the attitude of all manufacturers who are seriously in the industrial race.

A shop in which the policy and methods have crystallized into an unchanging form may be safely said to be unprogressive, and unless their product is of the nature of a monopoly the chances are that it will soon be left behind by more wide-awake and industrious competitors. Secretiveness as a shop policy may have certain advantages, but it is doubtful if they compensate for disadvantages thereby entailed which we need not enumerate. It is certain that such a policy cannot make up for progressiveness, and progressiveness seems impossible to any great extent when secretiveness is the rule.—[Machinery.

THE LARGEST DROP-FORGED WRENCH.

At the works of J. H. Williams & Co., of Brooklyn, N. Y., there was turned out recently the wrench shown in the accompanying illustration, believed to be the largest drop-forged wrench yet produced. It weighs 150 pounds and is 59 inches in length, the comparison in height with a man, as made in the illustration, giving at a glance a striking impression of the size of the wrench. It is the master product of a line of 15

THE LARGEST DROP-FORGED WRENCH.

degree angle wrenches created by J. H. Williams 17 years ago. The opening is 7⅝ inches and is designed for the nut on a 5-inch bolt. At the other end of the line of wrenches to which this belongs is one weighing ⅛ ounce, known as the No. 00 wrench.

The Ironton, O., *Register* gives some data in regard to the iron industry at Ironton in 1901 as follows: The Union Iron & Steel Co.'s furnace was in operation from July 9 to Jan. 1, made 16,000 tons of iron and paid out in wages $21,916.17. Sarah Furnaces produced 39,871 tons of iron and distributed about $152,000 in wages. Hamilton Furnace produced 42,160 tons of iron. Hecla Furnace has not been in operation during the year. Lawrence Furnace operated steadily with an average output of about 38 tons daily, except a shut-down from May till November. Vesuvius ran a good part of the year, making 7 tons of charcoal iron daily. The Eagle mill produced 14,142 tons of muck iron and scrap bar, and 14,442 tons of finished iron, and distributed $158,199.50 in wages. The Foster Stove Co. made 256 heats, with a total of 1,123 tons, in 1900, and 236 heats, with a total of 1,125½ tons, in 1901. The sales for 1901 were 10 per cent greater than for 1900.

PERSONAL.

J. D. Dwyer, superintendent of the Birmingham Rolling Mills at Birmingham, Ala., operated by the Republic Iron & Steel Co., has resigned. Mr. Dwyer has been superintendent of this plant for 22 years. He will be succeeded by Superintendent J. H. Pritchard, of the Gate City Rolling Mills of the Republic Iron & Steel Co. T. P. Walker, formerly assistant superintendent at this plant, will be appointed superintendent. George Jones has been made Mr. Walker's assistant.

Chester B. Albree returned to Allegheny, Pa., last week, after an extended tour through Europe.

Benjamin H. Taylor has been appointed chief engineer of the Bessemer & Lake Erie railroad, with headquarters in Pittsburg, to succeed W. H. Smith, resigned.

A. M. Swan, sales manager of the Henry S. Mould Co., of Pittsburg, manufacturers of briquetting machinery, returned last week from a business trip extending over a period of seven months. Nearly every smelter in North America was visited, the trip covering the United States, British Columbia and Mexico. The Mould briquetting machines are being used in the smelting plants in the West and many new orders were secured.

William H. Donner, president of the Union Steel Co., of Pittsburg, Pa., left last week on a trip to Virginia.

Joseph S. McDonald, at one time connected with Thomas Carlin & Sons, Allegheny, Pa., and recently connected with the Kelly & Jones Co., of Greensburg, Pa., left last week for Manchester, Eng., where he will assume charge of the brass and gray iron foundries of the British Westinghouse Co. For the past two months Mr. McDonald has been engaged in visiting the Westinghouse foundries in the Pittsburg district.

W. P. Snyder, of the Shenango Furnace Co., and Major George A. Laughlins, of the firm of Jones & Laughlins, Ltd., Pittsburg, Pa., sailed for the West Indies and Mexico last week.

W. R. Clifton, formerly manager of the Mingo Junction furnaces of the National Steel Co., has been appointed manager of the stack of the Sharon Steel Co., Sharon, Pa., to succeed Guy R. Johnson, resigned.

W. D. Hardesty, superintendent of the Falcon mills of the American Sheet Steel Co., at Niles, O., has been made division superintendent of the company's mills at Niles and Struthers, O. C. J. Thomas, of the Struthers mill, has resigned and has been succeeded by W. H. B. Ward.

O. O. Laudig, until recently superintendent of the Joliet, Ill., furnaces of the Illinois Steel Co., and recently transferred to a similar position at the South Chicago, Ill., plant, was presented with a chest of silver by the employes at the Joliet plant upon severing his relations with them.

A. N. Cleaver has resigned as treasurer of the Bethlehem Steel Co. Henry S. Snyder, secretary of the company, was elected Mr. Cleaver's successor.

William Clymer, superintendent of the Topton, Macungie and Henry Clay furnaces of the Empire Iron & Steel Co., Allentown, Pa., has changed his headquarters from Topton, Pa., to Reading, Pa. James McKeever has been appointed assistant superintendent of the Topton furnace.

H. L. VanValkenburg acted as toastmaster at the second annual banquet of the employes of the detail engineering department of the Westinghouse Electric & Mfg. Co., held at the Hotel Lincoln, Pittsburg, on Saturday, Feb. 8.

O. W. Russell, formerly editor of *Power and Transmission*, and advertising manager of the Dodge Mfg. Co., of Mishawaka, Ind., has severed his connection with that concern and has been made advertising manager of the Pittsburg Gage & Supply Co., of Pittsburg.

H. A. Johnson has resigned as traveling salesman for the Crucible Steel Co. of America, to accept a similar position with the Colonial Steel Co., of Pittsburg, manufacturers of the Red Star brand of tool steel. Mr. Johnson's headquarters are now at No. 36 La Salle St., rooms 610-612, Chicago.

Arthur K. Reese, formerly blast furnace manager for the Maryland Steel Co., has accepted the position of blast furnace superintendent at the works of Guest, Keen & Co., Dowlais, Eng.

Albert L. Schultz, head of the operating department of the American Bridge Co., with headquarters at Pittsburg, has tendered his resignation to become effective March 1. He will be succeeded by Marshall Williams, inspector of shop practice, with headquarters at the Pencoyd Works, Philadelphia, Pa. The Pittsburg district of the American Bridge Co. embraces all the plants between Philadelphia and Western Ohio.

W. B. Lewis, formerly metallurgist for the Sargent Co., of Chicago Heights, Ill., has resigned to accept a similar position with the Shickle, Harrison & Howard Iron Co., of St. Louis.

John Dorsey, formerly master mechanic of the Southwest Connellsville Coke Co., has been appointed to a similar position with the Pittsburg Coal Co., with headquarters at Pittsburg.

Charles H. Wood, formerly superintendent of the Toledo, O., plant of the Shelby Steel Tube Co., has resigned to become assistant manager of the Seamless Steel Tube Co., of Detroit, Mich.

B. F. Jones, of Jones & Laughlins, Ltd., Pittsburg, is sojourning in company with a number of his friends and relatives, at Palm Beach, Fla.

L. S. Moore, who for 31 years was manager of the Pittsburg office of the Fairbanks Co., has resigned on account of ill health. He has been succeeded by Stephen C. Smith, formerly connected with the New York office of this concern.

E. Fitts, formerly connected with the Detroit works of the Murphy Stoker Co., as erecting engineer, has been placed in charge of the Pittsburg office.

Wayne Wills, of Rogers, Brown & Co., Chicago, was married last Monday evening to Miss Evadnah Williams, daughter of C. S. Williams, of Chicago.

W. C. Waterbury, formerly president of Forster, Waterbury & Co., Franklin Park, Ill., and who for some years previous was the Chicago representative of the Iroquois Furnace Co. in the sale of its iron, has accepted an engagement as salesman with David Evans, Monadnock block, the Chicago representative of the Sloss Sheffield Steel & Iron Co. Mr. Waterbury for the past two years has been confined to his house by illness.

President Schwab, of the United States Steel Corporation, who went abroad in December, has sailed from Liverpool for New York.

J. B. Wilson, formerly connected with the mechanical department of the Grand Trunk Railway, has been made manager of the new Canadian offices, by the Standard Pneumatic Tool Co., of Chicago, just opened at 103 Union Station Arcade, Toronto. In the future all machines for Canadian customers will be shipped direct from the Toronto office.

The National Steel Refining Co., with executive offices in the Bourse Building, Philadelphia, states that arrangements are now being made for the enlargement of its mill at Carnegie, Pa. This company has been recently formed to manufacture under the Jamison process, tool steel of high grade, and it states that this steel can be produced at a much less cost than crucible steel.

The American Air Compressor Works, Havemeyer Building, New York, announces that in view of the sale of the Clayton Air Compressor Works by James Clayton, to the International Steam Pump Co., they have organized a company for the sale of machines similar to those heretofore made at the Clayton works. These include air and gas compressors, carbonic acid gas machines, air receivers and vacuum and tar pumps. The American Air Compressor Works are located at Van Brunt and Summit Sts., Brooklyn, the plant being formerly the South Brooklyn Steam Engine Works, with which John J. Riley, treasurer of the American Air Compressor Works, has been connected for the past 40 years. There is a blacksmith shop, foundry and machine shop equipped with the latest machinery. Wm. S. Fairhurst, lately manager of the Clayton Works, will have charge of manufacturing. Frederick B. Vail, lately manager of the Clayton offices, will have charge of the sales department, with headquarters in the Havemeyer Building, 26 Cortlandt St. All the important patents under which the Clayton compressors have been constructed have expired.

The American Bridge Co., of New York, has the contract for erecting the foundry for the Snow Steam Pump Works, at Buffalo, N. Y., E. C. Lufkin, manager. Plans are being prepared for a machine shop and a two-story office building. The improvements will cost $500,000.

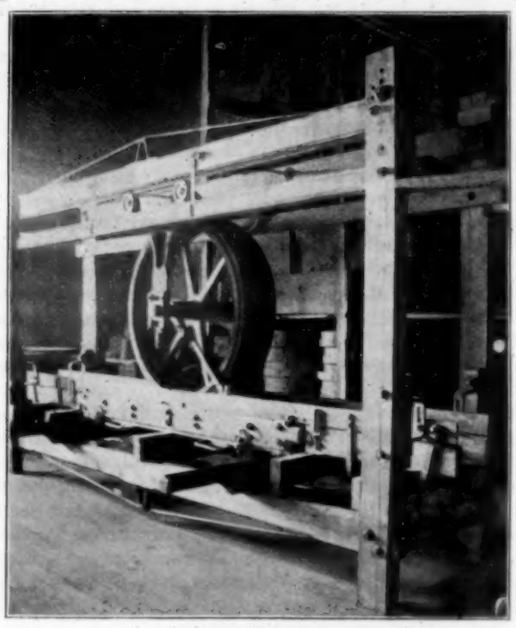
THE FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club in Philadelphia, on Wednesday, February 5, with a good attendance of members. The president, Thos. I. Rankin, occupied the chair. The following were present, all from Philadelphia, unless other address is noted:

Thos. I. Rankin, Abram Cox Stove Co., Philadelphia; Jas. S. Stirling, Harlan & Hollingsworth, Wilmington, Del.; Stanley G. Flagg, Jr., Stanley G. Flagg & Co.; J. Thompson, J. Thompson & Co.; W. H. Hunt, Wm. Adams & Co.; A. G. Warren, J. W. Paxson Co.; Mr. Cunningham, A. & P. Roberts Co.; Geo. C. Davis, chemist; Jas. L. Keightley, Geo. V. Cresson Co.; Al. Belfield, H. Belfield & Co.; W. J. W. Moore, Pilling & Crane; R. C. Oliphant, Trenton Malleable Iron Co., Trenton, N. J.; Gus. Stahl, Girard Iron Works; Mr. Roberts, Bernstein Manufacturing Co.; J. J. McCrystal, Girard Iron Works; T. B. Harkins, T. B. Harkins Foundry Co., Bristol, Pa.; Oregon Ward, Howe Scale Co.; F. A. Riehle, Riehle Bros.; P. D. Wanner, Reading Foundry Co., Reading Pa.; A. A. Miller, *Iron Age*; J. B. Rufe, U. S. Cast Iron Pipe Co., Lansdale, Pa.; S. C. Bunting, Haverford, Pa.; J. Hy. Pepper, *The Iron Trade Review*; H. O. Evans, Thos. Devlin & Co.; Wm. Hanson, Penna. Iron Works Co.; Wm. Hamilton, Harlan & Hollingsworth Co., Wilmington; P. S. Brauscher, Philadelphia & Reading Shops, Reading, Pa.; Howard Evans, J. W. Paxson Co.; S. Groves, British Westinghouse Co., Manchester, Eng.

The Rufe Molding Machine.

The paper of the evening was on "The Rufe Power Molding Machine for General Work," by J. B. Rufe of the United States Cast Iron Pipe & Foundry Co., Lansdale, Pa. The paper was read by S. C. Bunting, Jr., and was as follows:



THE RUFE MOLDING MACHINE.

"The construction and operation of the machine presented for your consideration this evening, is very simple. The manner of forming the mold differs radically from that of other machines, giving it, I think we may justly claim, a broader scope and adaptability to a greater variety of work. The machine consists of a framework of uprights, cross-bars, sidebars and sills, especially adapted to resist the strain incident to forming the molds. The molding wheel is suspended in hangers, its shaft being journaled in the lower end thereof while the upper end of the hangers have grooved rollers journaled upon them, the rollers traveling upon tracks secured to the side bars. The amount of pressure exerted by the wheel is regulated by means of coiled springs bearing upon the boxing of the journals of the shaft and controlled in its compression by bolts. The heads of the latter are secured in the hangers, and passing through the springs are provided with nuts which bear upon the lower end of the springs.

"It is necessary that the sand forming the mold shall be compacted within the flask at a uniform density to suit the pattern, and in order to insure this we use supplementary side bars, the office of which is to contain the sand in addition to that within the flask, to compensate for compression. The amount of sand to be compressed is regulated by an adjustable gauge, which travels upon the side bars in advance of the molding wheel, striking off more or less sand, so as to give the required density.

"In forming the mold the follow-board, or pattern-plate, is laid upon the V-shaped tracks, covered by the flask and placed under the side bars in position to receive the sand. After the sand is filled into the flask, the wheel is passed over it once, forming the mold, the wheel passing onto a table at either end of the frame. To remove the flask the sidebars are raised by means of a lever, the flask and follow-board are withdrawn upon the tracks and the mold removed.

"In the machine which we have used as an illustration, the plate shown is 6 feet 3 inches long, and in machines of this size a large number of small molds can be made or a number of small flasks can be used at the same time. New or special patterns are not required and all straight or square flasks can be used, wider rims being adjusted to the molding wheel to conform to the width of the flasks. The special feature which we desire to emphasize is the mechanical means of applying an amount of even ramming or pressure, which is limited only by the strength of the frame. Mr. Rufe, one of the inventors, is present. He has used the machine which we have before us, in making molds for various castings and will be glad to give information on any point desired.

Discussion.

Mr. Hanson.—What are the mechanical motions for moving the wheel over the flask?

Mr. Rufe.—We pull it with a rope. One man does the work. It is supposed to be run with a screw gear and an endless chain. The machine is in operation at Lansdale. The wheel on the machine shown in the photograph I have passed around, weighs 400 pounds, but a wheel of that weight is unnecessary, half the weight being quite sufficient.

Mr. Hanson.—How much compression of sand do you get there. How deep do you compress it?

Mr. Rufe.—It compresses to about 1¼ inches depth.

Mr. Groves.—There was an objection established some years ago to pressures of this kind. It was considered that machines having steady pressures on the flask were defective, a direct blow being the force required. With this machine you can get a steady definite pressure, and there is no blow whatever.

Mr. Rufe.—In operation the wheel traveling over the sand presses the sand in front of it. It crowds the sand right on ahead of it, and everything comes down equally.

Mr. Groves.—The pressure is longitudinal. How about the transverse pressure? If there is a projection on the side of the flask you will not get the effect desired.

President Rankin.—The wheel is wide enough to cover the flask.

Mr. Groves.—Yes, but the pressure is all in one direction.

Mr. Rufe.—I have made P sewer traps, the molds being as perfect as anybody would want. The traps were about 17 inches wide and about 2 feet 5 inches long, somewhere about 5½ inches deep.

Secretary Evans.—When the roller leaves the sand and goes onto the flask how do you effect the tucking?

Mr. Rufe.—There is a gate at the end of the flask not shown in the photograph, and when the molding wheel strikes this gate it upsets it and after the wheel has passed it springs back to its place.

Mr. Flagg.—How do you get your pattern out of the mold?

Mr. Rufe.—Just lift it up and take it off. We do not drop it at all. The pattern is stationary.

Mr. Groves.—How do you rap it?

Mr. Rufe.—We do that with a maul.

Chairman Rankin.—I suppose, Mr. Rufe, your work being largely on sewer pipe the machine was gotten up for this?

Mr. Rufe.—Yes.

The British Westinghouse Works.

There being no further business before the meeting, Secretary Evans introduced Mr. S. Groves, whom he said every member of the Association knew and admired. Mr. Groves

he said had severed his connection as foundry engineer to the Westinghouse Machine Co., and had accepted the position of consulting foundry engineer with the British Westinghouse Electric & Manufacturing Company and would take charge of this department at the mammoth works now being erected at Manchester, Eng. While all would regret the loss the foundry interests of this country would sustain in the removal of Mr. Groves to another sphere, Mr. Evans was sure that the best wishes of the Association would follow Mr. Groves to his new field.

Mr. Groves feelingly responded, speaking in part as follows:

"In 1894 it was my good fortune to be invited by you to read a paper on 'Gear Molding Machines' at one of your meetings. It seems to me that that was a rather interesting point in my own career, as the publication of that paper was my introduction publicly to the foundry interests of the United States. I sail for England next Saturday, and it is a singular coincidence that my first and my last public appearance was made before you. When I read the paper referred to I was careful and anxious in doing so to give credit to every inventor along the same line that preceded me in the designing of machines of this character. Since then I regret to say that my ideas have been wilfully appropriated without credit to me, and in a manner highly reprehensible.

"Inasmuch as Mr. Evans has mentioned the work I am going to do I will say a word about that. In 1898 I went to Europe for over three months and wrote a series of articles in the *Foundry* describing my visits to the principal plants. I pointed out how really backward they were in comparison with our equipment and practice over here. On my return I was engaged by the Westinghouse Machine Co. as foundry engineer, to design the equipment for their foundries. Before doing that I laid out all the heavy machinery in the machine shops. When everything was completed it was determined that the shops should turn out Corliss engines, and I designed all the flasks for the work. Those of you who read my article in the *Foundry* for December, will be familiar with this work. In September last the British plant, which is operated by an entirely separate concern, engaged me to design and take charge of their new foundries. In five days I planned the foundry and hope it will show an advance on my previous designs. It will be 573 feet long, the middle bay 80 feet wide between centers of columns. The side wings will be 50 feet wide. The center bay will have four 50-ton cranes 54 feet lift. The main columns along the main bay will have jib cranes working around a circle. Between the 50-foot travelers there will be a series of walking jib cranes, making practically three lines of cranes. In the center of the foundry, midway between the two ends of one side there will be four cupolas, two 72-inch and two 60-inch. These will be put in one of the sidewings.

"Outside the foundry will be a metal platform 20 by 200 feet, with a central elevator about midway, and two sidings of rails through that. The metal will all be stored there and can be sorted out very readily. Between two of the cupolas will be a conveyor, and on the inside rack will come a truck of coke, the coke being dropped directly on the platform where two weighing machines will be conveniently disposed. On the left of the cupolas, for about 210 feet will be a space devoted to machine molding. One of the cupolas will not only tap into the main bay but will run into the side bay. A little later we will put in a second floor and do our molding there. There will be a series of eight bins where all the mixing of the sand will be done. On the south side will be two core ovens each 12½ by 20 feet. I hope some day to present a detailed description of the plant to you, believing that I can still further interest you."

Mr. Flagg.—Is it true that in connection with the works a town is also to be built?

Mr. Groves.—Yes, quite. I understand there are to be about 5,000 houses built entirely upon the American plan. The works are located in the middle of a park and within about 30 feet of the great Manchester ship canal, so you can see what the shipping facilities are likely to be.

The meeting, by a rising vote, congratulated Mr. Groves upon his new prospect, and Mr. Groves replied, making some happy references to the cordial relations existing between the two countries in which his interests lay.

After adjournment an excellent lunch was served.

LAKE SUPERIOR IRON MINES.

Pickands, Mather & Co., of Cleveland, and the Youngstown Iron Sheet & Tube Co., of Youngstown, O., have acquired jointly two promising properties on the Mesabi range in the past week. In both cases the leases were held by Alex. Maitland, of Negaunee, Mich., who acquired them about a year ago. One is a forty just south of the Fayal mine in the Eveleth district, and is known as the n. e. ¼ of the n. e. ¼ of sec. 7, 57, 17. The other property consists of two forties, and is known as the w. ½ of s. w. ¼ of sec. 32, 58, 20, being in the Hibbing district, one-half mile northeast of Hibbing and about 2½ miles northeast of the Mahoning mine. The Youngstown company and Pickands, Mather & Co. will incorporate a company to operate the two mines. The ore bodies have been thoroughly test-pitted in both cases, but no mining has been done. It is probable that the two will be mined on the underground plan. On the Hibbing property the deepest drill hole on the Mesabi range, 412 feet, mostly in ore, has been put down.

Probably the most important new operation on the old ranges is that at the Maas mine of the Cleveland-Cliffs Iron Co., located in the northeastern part of Negaunee, Mich. It is about half a mile from the well known Negaunee mine, and the property was located and diamond drilled by Geo. Maas, whose father for many years operated the Humboldt mine at Humboldt, Mich. Mr. Maas purchased the lands and last year turned them over to the Cleveland-Cliffs Iron Co., which put down 16 test holes to determine the position and extent of the ore body and the best location for the shaft on the sinking of which work has just begun. The shaft will be 10x14 feet within timbers and will have one cageway and two skipways. Two Prescott and two Knowles pumps are on the ground, three 16-foot by 72-inch tubular boilers, and two hoisting drums. It is estmated that something like $200,000 will be spent in preparing to mine ore. This fact and the amount paid for the lease indicate every confidence that the mine will prove satisfactory both as to quantity and quality of ore.

The exact total of ore shipments from the Helen mine, Michipicoten range, in 1901 was 220,607 tons.

The new crushing plant recently installed at the Republic mine is now ready for operation. Crushing will be carried on only during the shipping season. This is the last of the hard ore mines to crush its ore.

At the meeting of the stockholders of the Champion Iron Co. to be held in Boston, Feb. 19, a resolution will be acted on authorizing the directors to sell or lease any lands belonging to the company and not deemed necessary for mining purposes, on such terms as they may see fit, with or without mining reservations.

The campaign of the Eastern Minnesota Railroad of James J. Hill, for Mesabi ore properties, is the most important factor in recent developments on that range. The absorption of the other two railroads on the range, and of most of its leading ore properties, by the United States Steel Corporation, led the Eastern Minnesota to go actively into the market for mines and ore lands that its future as an ore carrier might be secure. Large holdings have been secured in the past year and the Eastern Minnesota is preparing to take care of an increasing business by building a 600-ft. addition to its newer dock at Superior. This addition will cost $300,000. The Hill interests have contracted for 1,000 steel ore cars.

Jones & Laughlins, Ltd., will open the Grant and Lincoln mines, near Virginia, on the Mesabi range this spring. The property belongs to the state and the royalty is 25 cents per ton. It is probable that fully 100,000 tons of ore will be taken from these properties this year. During the past two years Jones & Laughlins, Ltd., have largely added to their ore holdings and it is their intention to make further increase in ore properties this year.

The Ohio Brick Co., Oak Hill, O., reports that it has recently secured a large order for fire brick for the Central Coal & Iron Co., Tuscaloosa, Ala., and has other contracts for furnishing brick for the repair of blast furnaces in the South and Northwest, together with orders for several hundred coke ovens. The product of the company is used largely for blast furnaces and coke ovens.

OPERATIONS IN MACHINE MOLDING.*

BY S. H. STUPAKOFF, PITTSBURG.

Broadly speaking, it is understood that molding means making a depression, an impression or a cavity, in sand or in a similar yielding substance. This cavity is filled subsequently with a liquid mass that sets, hardens, congeals or solidifies. The purpose of this process is to produce a casting of an object of desired outlines.

The simplest manner of making a mold is by pressing an object of any description into a mass of plastic clay. Should we perform the same operation in a body of molding sand on the floor of the foundry we would produce what is commonly known as an open sand mold. Numerous articles are thus molded and subsequently cast in a perfectly satisfactory manner; whenever it is not important to have the face of the casting smooth or clean. This method is most extensively applied in producing our commercial pig iron. Floor plates, flask clamps, weights, and many other products of our iron foundries, which are made in the same manner, are too well known to require further comment. Yet even this simple manipulation requires that the sand used be of the proper quality and temper, that the face of the mold be made level, and that the sand be sufficiently compacted. We have here the fundamental principle of molding, which follows us throughout the whole art of founding.

As we may not return to this subject again, it may be well to state that castings are also produced in permanent molds. For iron we have examples in chilled pigs, rolls, car wheels, plow points, etc., and in general wherever a hard surface is desirable. It is common practice to cast white metal, pewter, or Britannia metal, into iron or brass molds. Glass is cast in a similar manner; plaster Paris is cast in wood, metal or

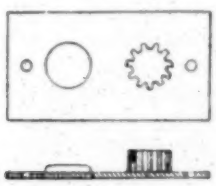


FIG. 1.

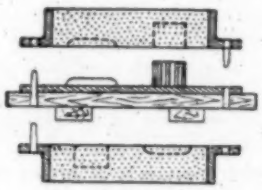


FIG. 2.

plaster Paris. Small articles of gold and silver are usually molded by pressing the patterns into a piece of cuttlefish bone (*sepia officinalis*). Plumbago is preferably molded in plaster of Paris or wood; and nearly all other plastic materials are cast, molded or compressed into metal molds.

It is, undoubtedly, a highly interesting study to follow the various branches of molding and casting into their details. For instance, to observe how intricate white metal objects are made by chilling a thin layer of the fluid material in the mold, then pouring out the liquid interior and thus producing hollow vessels of the most difficult shapes; or, to see how hollow rubber goods are made without any opening at all in the object, by enclosing a drop of water within a lump of the plastic mass, then causing the water to expand, thereby enlarging the cavity and forcing the material into the finest engravings of the surrounding mold. But all this would lead us far astray from our present subject, and as far as may be, we shall confine ourselves in the following pages strictly to the process of sand molding.

It is well known, that it requires long experience and exceptional skill to produce the large variety of castings in iron, steel, brass, bronze, or aluminum in sand molds, and it is understood that even these branches of the founding business are divided into numerous sub-branches, which are in the hands of specialists. No foundryman would expect a molder to be equally good on hollow ware, stove castings, light or heavy machinery castings and ornamental work. It requires a most skillful mechanic to master any one of these branches successfully. Let us but look over the long list of patterns and over the large variety of shapes, which come under the heading of each class, and we will no longer doubt that the constant changes to which the molder has to adapt himself require at least good judgment on his part.

*From the Journal of the American Foundrymen's Association Second article in a series on "The Molding Machine."

Economy in Production.

On the other hand, we must admit that this is not true in all cases. All castings are not intricate. Some shapes are exceedingly simple; in a great many instances the same pattern has a long continuous run, then again many foundries produce articles which are frequently duplicated in considerable quantities; while there are others working on specialties which are making only one kind or one class of castings year in and year out. These are but a few of many instances in which the same operations are constantly repeated, where the same manipulations are gone through over and over again, in the end becoming not only monotonous, but often distasteful to the skilled mechanic. In fact, his services are generally dispensed with in cases of this kind. His skill can be and is employed elsewhere to better advantage and to the better satisfaction of both parties. Such work, therefore, is turned over to selected foundry laborers.

It is the natural tendency of all foundry owners, superintendents and wide-awake foremen, to increase the production of their foundries with the least possible expenditure; and therefore less experienced men will gradually be entrusted with work which becomes more and more difficult to perform. Mechanical means and contrivances are frequently resorted to, to encourage green hands to expedite matters, and to insure success. All such labor saving devices are especially designed for the purpose of insuring a larger output, and to obtain more uniform, better, and cheaper castings, and in some degrees to

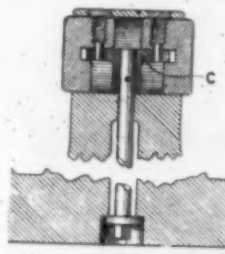


FIG. 3.

PLAN OF C.

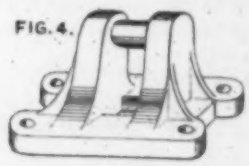


FIG. 4.

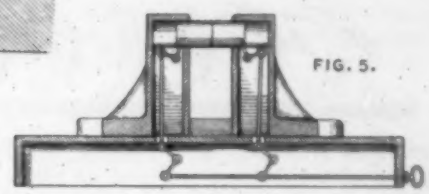


FIG. 5.

take a part of the responsibility from the molder, and shift it upon the shoulders of the patient pattern maker. But while such mechanical means are almost a necessity in the hands of less experienced men, they are none the less a great convenience and material help to the expert molder.

Gates, Cards and Plates.

To commence with the simplest of all labor saving devices for molding we must take up the loose gate or runner. This is placed on the mold board, next to the pattern and rammed up with it. Its advantage is evident in saving the hand work necessary for cutting the gate in the sand. In some instances these gates are directly connected to the pattern, forming one piece with it, thus saving the separate lifting of it out of the sand. Two or more patterns are frequently secured together to form a gate; sometimes, especially for small castings, a dozen or more patterns are thus fastened together. Many molders prefer carded patterns, i. e. patterns fastened to a plate, to the usual gated ones. They have undoubtedly an advantage over the latter; they are stronger and they can stand more abuse.

It is sometimes more advantageous to use two independent plates for one set of patterns. If this is the case, one of them will be used for the drag side and the other for the cope side of the patterns. Should these two plates be held or secured together, with their backs adjoining they would be practically the same as the above mentioned cards.

Match plates should be used with gated or corded patterns, to insure satisfactory working. They are rarely necessary when the patterns are placed on one side of the plate only. Using the face of a straight mold board as a bed for the plate to insure molds true to pattern will be found sufficient in most instances. By working each half by different men, double the quantity of castings can be produced in the same time, with patterns arranged in this manner, than when gated or carded. But it requires a set of carefully prepared flasks, which are

especially fitted to the plates, to enable their use and successful application.

A pair of plates can be produced without much difficulty by first drilling the full patterns at right angles to their parting faces for the necessary dowel pins or screws, then placing the two plates back to back together, inserting accurately fitting flask pins into holes provided for them therein, and suitable arranging and clamping one-half of the patterns on their upper face. The holes drilled previously into the patterns are then used as jigs or guides for a drill to drill corresponding holes through both plates, and the lower halves of the patterns will match with the upper ones if secured to their respective positions.

The shape of the patterns often permits them to be molded with either side in the cope or in the drag. When this is the case, they can be advantageously secured to one side of the plate only, and the same plate, or rather the same side of the plate, is then used to produce both cope and drag.

Patterns prepared in this manner belong to a group possessing radically different characteristics from those of the foregoing. The nature of this arrangement involves some intricacy, and to insure good castings the application of the patterns to the plates demands the utmost accuracy and greatest care at the hands of a skillful mechanic. A simple illustration will best serve to explain this subject.

Let us assume we have the pattern of a pinion with a flange on one of its sides. Ordinarily, we would leave the flange loose, place the toothed portion of the pattern on a mold board, ram it up in the drag, then turn over the drag with pattern, put flange in place, ram up the cope, lift off cope, turn it over,

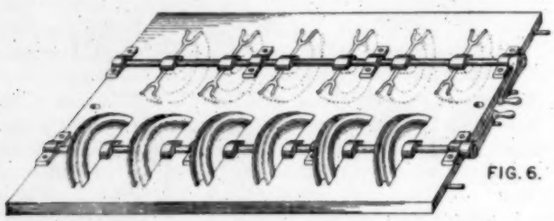


FIG. 6.

withdraw both parts of the patterns, and finally close the flask. When plated patterns are used we make two pinions as described in one flask, by securing the toothed portion and the flanged portion separately, but exactly in alignment with each other and at equal distance from the flask pin holes on the same face of the plate, as illustrated in Fig. 1.

Thus prepared, the plate is placed on a mold board, a portion of the flask placed over it and rammed up with molding sand, and naturally we will get an impression of each of the patterns in the same part of the flask. The same process is then repeated with the second half of the flask and the same impressions are obtained in this one. Now, in placing these two portions of the flask together, it is only necessary to observe that the cope is turned in such a manner that its flanged portion will cover the toothed portion of the drag and vice versa. To avoid possible mistakes of this kind, each portion of a flask has only one pin which fits in a corresponding hole of its mate. The mold board is provided, likewise, with one pin and one pin bushing and carefully fitted to plate and flasks. Fig. 2 illustrates the relative positions of the cope and the drag, the plate with pattern on the mold board is shown directly under the cope, indicating their relative positions directly after lifting off.

The advantage of this method of molding over the ordinary practice is apparent. It insures double the output with the same number of patterns and the same expenditure for labor. Good patterns with plenty of draft are easily withdrawn from the mold by carefully raising the plate, more or less rapping is necessary if patterns have little or no draft, or if their shapes are complicated. The rapping of the plate itself must be avoided; it is of little or no use if it fits closely to the flask pins as it should and in all cases it will have a tendency to damage not only the plate, but also patterns and flasks. This suggests the use of a double plate, one of them a stripping plate, which lies nearest to the face of the flask, and the second one a draw plate to which the patterns are secured. If held together and guided by independent pins which can be located outside the frame of the flask and move in bushings which should be closed above, we have a serviceable, inexpensive substitute for the molding machine. In fact, as a hand operated device, it is undoubtedly a very close approach to the more elaborate and more expensive molding machine.

While in the foregoing only straight plates have been described, it should be noted that these are not always suitable. Patterns cannot always be parted in straight lines, or, correctly speaking, in planes. Parting lines may consist either of broken straight lines, or of curves, or they may be composed of a combination of both. It is obvious, that the surface of the plates should correspond with the parting lines of such patterns, if they are to be plated. Sometimes there are good reasons to make the underside of the plate follow the shape of its upper surface, especially when the deviations from a plane amount to considerable depths, while in other instances when shallow—it may be preferable to make it in a straight plane. Plates with irregular undersurface must be used in connection with suitable match plates or match boards.

Other conditions may recommend the placing of one portion of the pattern above and another portion below the plate, especially when castings of hollow cross sections are to be produced. Plates arranged in this manner are practically pattern and match in one piece. These have the advantage that straight plates can be used in place of irregular shapes. Irregular shaped plates are always expensive. For this reason alone, if for no other, they should be avoided, if possible.

Matches, when used in connection with plated patterns, may be temporary or permanent. Temporary matches are made of molding sand in a flask belonging to the set fitting the plate. Permanent matches are made of oil sand, plaster of Paris or wood. They are always preferable for a continuous run of work. Frequently, if made of wood, they take the shape of a match board, or box, with certain portions cut out of it to permit of a protrusion of such parts of the patterns which extend beyond the undersurface of the plate.

The plates referred to in the foregoing, embrace nearly all variations with fixed and stable patterns which are in general use in our foundries. But before disposing of this subject we must mention as a class, distinct from the above, plates with movable patterns and plates with movable portions of patterns, which may be well termed and classified as mechanical pattern plates.

Many patterns have projections which make their withdrawal from the sand impossible without extra operations. Such projecting portions are usually secured loosely to the pattern by dovetails or dowels, and arranged in such a manner that they will remain in the mold when the main body of the pattern is lifted out of it. They are then picked out separately, and great care must be exercised by the molder that his mold is not being destroyed while he accomplishes this operation. This is always a tedious and costly manipulation, and gives just cause to the fervent wishes and sincere recommendations of the molder (always expressed in the strongest possible language) that the designer of such patterns should be compelled to serve a just and legal time as apprentice in a foundry.

When such projections cannot be avoided, these obstacles to molding can be quite frequently overcome by withdrawing them within the patterns by suitable mechanical means, before the main body of the pattern itself has been removed from the mold. Single patterns can be equipped in this manner, but especially when metallic and plated patterns are used, such an arrangement is oftentimes advisable, and its application in practice will give not only satisfaction, but it will prove to be of advantage to the manufacturer and a desirable convenience in the hands of the molder.

Fig. 3 illustrates a simple device for withdrawing in a single operation two projecting hubs sideways from the sand into the body of the pattern. The hubs are fitted into a corresponding recess of the pattern and each is provided with a screw or pin which reaches into a slot cut at right angles to its axis. In the slot lies a disc with cone-shaped openings which receive the ends of the pins or screws. A shaft is driven into the cam disc and reaches through the pattern to its face. A rotary motion can be imparted to the shaft by applying a socket wrench to the square at its lower end which in turn will act upon the pins of the hubs and move them inward or outward as the case may be. It is obvious that in this manner projections can be picked out of a mold at a depth and within

a space, which would be quite impossible if attempted by hand.

As an example Fig. 4 illustrates a casting with similar features, and Fig. 5 gives the cross section of the pattern for this casting secured to a plate, with an arrangement which will accomplish the desired object.

Plates, when properly equipped, are also admirably adapted to withdraw the entire pattern from the mold, before the flask is being lifted off. . . . This arrangement is especially valuable for molding wire sheaves, pulleys, discs, wheels and similar shapes which, when revolved around their center will permit of their turning out of the mold. Fig. 6 shows a device of this kind equipped with patterns of webbed chain sheaves, part of them being in the position they would occupy in the flask while molding, and part of them being withdrawn.

Such a device, though merely a plate with movable patterns, is practically a stripping plate molding machine in the fullest sense of the word. In fact there are few of the many elaborate designs of molding machines more perfect, more effective and more serviceable than this. Its application, however, is limited; it is little known and rarely used. It is costly to produce, as it requires exceedingly careful workmanship, and an equipment of flasks which must be kept in excellent condition to insure castings.

All plates, as described, are used with good advantage independently, but they can, without any alterations, be used equally well in connection with molding machines, and in most cases they are actually one of the principal parts of them. In concluding this chapter there remains to be considered to what extent plate molding is to be recommended for adoption in our foundries, and to summarize the principal advantages which it presents over ordinary hand molding. The following deductions are made from the foregoing explanations:

1. Plated patterns give the best service when used continuously.
2. Castings which are to be produced in quantities are preferably molded with plated patterns.
3. Standard patterns are preferably plated for economic production in the foundry.
4. When plated patterns are used, good flasks only will insure good castings.
5. Accurate workmanship is one of the main requisites in plated patterns.
6. Plated patterns should be made of metal to give good service.
8. The use of wooden patterns on plates is not excluded.
9. All patterns when placed on plates should be provided with plenty of draft.
7. Plated metal patterns are preferably made hollow.
10. Rapping is destructive to plates and plated patterns.

GERMAN BUSINESS DEPRESSION AND ITS LESSON FOR AMERICAN MANUFACTURERS.

Consul General Frank H. Mason, writing from Berlin early in January, makes valuable observations to the State Department on the extent of the depression in Germany and the way in which German manufacturers have turned their export trade to advantage in the midst of the severe stress at home:

The year 1901 closed upon a depressed and anxious situation in Germany. The reflections of the leading newspapers in reviewing the record of 1901 are, for the most part, gloomy and depressing. In commenting upon the generally unpromising outlook, the *Berliner Tageblatt* of December 30 says:

"The hopes of industrial circles for a betterment of the present conjuncture have thus far not been realized. On the contrary, the situation grows worse from day to day. The railway receipts for October, this year, were 3,500,000 marks ($833,000) less than those of October, 1900, notwithstanding the increased population and the extension of railway mileage. The freight traffic shows a decline of 5 per cent per kilometer. The manufacturers of machinery are living principally on their work for export to other countries. The exports reveal no perceptible decline; in some important classes they even show an increase. Since imports have perceptibly fallen off, Germany's balance of trade for 1901 will show a much smaller excess of imports over exports than that of the preceding year. Assuredly, this at least is a favorable indication for the business situation in Germany, the general character of which is vividly illustrated by the fact that in Berlin 180 firms in the foundry, machine, and electro-technical industries have appealed to the Prussian Ministry to give them work at the bare cost of production, in order to spare them from the necessity of further discharging their employes. Many people see in the low interest rate for money and the strong apparent inclination toward the emission of foreign securities the sign of a returning confidence and revival of enterprise. But whoever looks deeper will find in these facts the expression of deep-rooted mistrust in the economic situation of Germany. The spirit of industrial enterprise is, in spite of reduced wages of labor, practically dead, and it can not revive so long as the uncertainty concerning the future treaties of commerce remains."

While this somber description of the present commercial and industrial situation is no doubt substantially true, there is fortunately some reason to hope that it is in one respect overdrawn. It is not true, for instance, that the feeling of mistrust is increasing, or that it is so general and pervading as it was a month or six weeks ago. On the contrary, there prevails in well-informed circles an apparently well-founded belief that the worst is over. For eighteen months past German financiers and business men have lived in the fear of a general collapse, in which the Reichsbank, the Deutsche Bank, the Dresdener, and the other strong, ably managed monetary institutions which have battled so heroically against the current and aided scores of sound but weaker banks to weather the storm, would be forced to give up the fight, haul in their life lines, and leave the others to their fate. How serious this struggle has been will be indicated by the fact that the loss sustained through the depreciation of bank shares alone during the past year was estimated on October 1, 1901, at 2,000,000,000 marks ($476,000,000). The weekly organ of the Central Union for Commercial Geography, at Berlin, in its recent review of the year, notes as examples of the extreme fluctuations of certain banking securities the stock of the Dresden Credit Bank, which in its best days was quoted at 182, but fell at the end of August, 1901, to 13.25; the Leipziger Bank shares dropped from 194 to 9.75; the Muhlheim Bank, from 133 to 43; the Kummer Electrical Company, from 211 to 2.50; the Prussian Mortgage Bank, from 138 to 6.90; the Pomeranian Mortgage Bank, from 156 to 24.10; the Mecklenburg-Strelitzer Mortgage Bank, from 144 to 8.10—and so on through a long list.

When to this is added the enormous losses through depreciation in the values of industrial stocks of all kinds—notably those based on the iron, steel, and electrical industries—it will be seen that German credit and resources have been, in the main, strong and sound to have stood such a crisis without a general collapse and widespread bankruptcy. The fact that the great banks of Berlin have come through the year with their strength practically unimpaired, and in a condition to continue their dividends, has contributed powerfully to begin the restoration of public confidence and convince hopeful capitalists that the worst is over. The vital fact is that the general collapse which appeared imminent last September seems to be no longer dreaded.

Among the signs which are thought to indicate that the lowest point of depression has been passed and the long uncertain process of recovery begun, is the marked rise in various securities— notably certain bank shares—during the past two weeks. As an example of this, the stock of the National Bank for Germany—an institution with 60,000,000 marks ($14,280,000) capital, which was largely engaged in support of street-car lines and secondary steam railways— stood as low as 96.8 at the middle of November, but is now quoted at 105, for no other apparent reason than because confidence is returning and the prospects of all such railway property are looking up.

But the most notable, because the most authoritative, testimony on this point is found in a lengthy interview with President Kock, of the Imperial Bank of Germany, which appeared recently in the *Neue Freie Presse*, of Vienna. The Reichsbank, as is well known, is one of the most powerful and ably conducted moneyed institutions in Europe. It is the sheet anchor of German finance in fair as well as foul weather. Like the other leading German banks, it has devoted its energy, its capital, and its profound knowledge of affairs to the support and development of German industries and commerce with foreign lands. It has branch banking houses in all large

German cities, through which it maintains a close, unerring touch upon the pulse of business interests throughout the Empire. When, therefore, the president of the Reichsbank—after a tour among its branch offices, and after having visited factories and boards of trade and studied local conditions at the principal centers of manufacture—says that the worst is past and recovery begun, his testimony is accepted as evidence of the highest class. President Koch says, among other things, that in the textile industry, including the silk manufacture, new life and spirit are manifest. The brass and bronze manufacturers of Wurttemberg are active and hopeful, and the vastly developed electrical industries, which have been hit so hard by the reaction of the past eighteen months, once more begin to feel the thrill of returning vitality. For the iron, steel, and coal interests, President Koch sees no prospect of an early recovery; but the building trades, which occupy more than 2,000,000 skilled mechanics in Germany, consider their outlook far more promising than it was on New Year's Day a year ago. Germany ranks second among nations as a buyer of American products. Whatever saps its prosperity and diminishes the purchasing power of its people weakens to that extent one of the most important foreign markets of the United States. From every point of view, moral or economic, it will be hoped that the reassuring predictions of the Reichsbank's president may be fulfilled by the event.

Effects of the Crisis Upon American Trade.

It remains to consider the effects of the depressed conditions which prevailed in this country throughout 1901 upon the import and export trade with the United States. The official German import statistics for the year are not yet available. We have only the figures for the ten months ended Oct. 31. Comparing the imports of leading American products for the first ten months of 1901 with those for the corresponding period of the preceding year, the result is as follows, the statistics being given in metric tons of 2,204 pounds avoirdupois:

IMPORTS FROM THE UNITED STATES.

Article.	January 1 to October 31, 1900.	January 1 to October 31, 1901.
	Tons.	*Tons.*
Cotton	202,706	202 482
Cotton seed	2,653	3.415
Wheat	403,026	1,022,199
Rye	2,,054	31,859
Barley	56,221	8.449
Corn	947 669	767,643
Oats	43,356	48,415
Lumber, timber, and staves	243,986	238,764
Copper	57,302	37,147
Nickel	409	242
Pig Iron	16,502	10 708
Coarse castings	2 930	2,886
Cutlery and fine tools	187	125
Agricultural machinery	20 084	17,704
Electric machinery	274	267
Pumps and other machinery	4,075	3 078
Typewriters	40	69
Sewing machines	1,411	1,163
Bicycles and parts	114	77
Shoes, fine	39	55
Leather, and manufacturers of	415	332
Tobacco and raw stems	10 614	9,604
Pork meats and sausage	12,774	11,389
Salted beef	1,388	1,781
Canned meats	4,005	17
Lard	85 346	79,104
Oleomargarine	16 155	19,981
Oil Cake	148,768	167,312
Kerosene	573,025	575,481
Mineral and lubricating oils	66,229	68,166

Aside from the drop in canned-meat imports—which was the direct result of the new and practically prohibitory regulations enforced in this country—the decline of 20,000 tons in imports of copper, and the somewhat marked falling off in corn, there is nothing startling or discouraging in the foregoing exhibit. The decline of more than 2,000 tons in imports of agricultural machinery was to have been expected as the result of the short crops of winter wheat and rye last year in Prussia, but the inflow of such leading staples as cotton and petroleum remained normal and steady, and the increase of 619,173 tons in the imports of American wheat during a period of ten months will easily balance all other deficits in the foregoing list.

Exports to the United States.

Returns from the 32 consulates in Germany show that the grand total of exports to our country during the calendar year 1901, as declared by shippers in invoices presented for authentication, was $99,616,731.73, a decrease of $3,567,922.68 as compared with the exports of 1900, which amounted to $103,184,654.41. These statistics have the merit of promptness, but they are always subject to the qualification that the values as declared by the shipper for entry and appraisement not only include costs of packing and invoice authentication, but may in some cases be understated. Moreover, these returns make no account of the large and growing export of goods to our country as postal packages in shipments less than $100 in value, which require no consular invoice, and therefore are not reported or registered at consulates. With these defects, however, these statistics are probably as nearly correct as those of the German Government, in which values are based on an estimated average market price for each class of goods throughout a given year.

The deficit of $3,567,922.68 in the German exports to the United States in 1901, as compared with those of the last preceding year, is more than doubly accounted for by the decline in sugar, which is exported from the consular districts of Magdeburg, Hamburg, Stettin, and its agency at Danzig, with occasional small shipments from the district of Cologne. The exports of raw and refined beet-sugar from Germany to the United States were valued in 1900 at $16,332,552, but declined in 1901 to $7,827,349, thus creating in that one item a deficit of $8,505,203, which balances the general decline of $3,567,922 in the grand total of the year and shows that exports of general merchandise increased by $4,937,280 in 1901. When it is remembered that the whole export trade of Germany to the United States amounted in 1898 to $83,191,015 and to $90,916,778 in 1899, the slight decline of the past year from the high-water mark of 1900— due wholly to the aberrations of the sugar market—is, under all attendant circumstances, a result fairly satisfactory to this country. The exports to the United States from the consular district of Berlin including the agency at Sorau, include 56 different articles, mostly manufactured merchandise and varying from albums and artificial flowers to Welsbach mantles and earthenware. The traffic in these articles grows steadily from year to year, the declared values of shipments from this district having been $5,327,179 in 1898, $6,633,882 in 1899, $6,673,356 in 1900, and $7,558,790 in 1901.

A Lesson for the United States.

If there is in the history of the present crisis in Germany one definite, pertinent object lesson for the study of other nations—especially the United States—it is the manner in which many of its industrial and commercial interests have been sustained and carried through this period of stagnant and inert local markets by a well-established and skillfully supported export trade. During the years of her prosperity, Germany had laid the foundations of her foreign commerce board and deep. She has trained her young men for efficient commercial service in foreign lands and has subsidized new steamship lines and sent her ships, bearing not only her manufactured goods but her banking capital, her engineers, and her constructors to the remote regions of the earth. In some instances, this may have been done unwisely or to excess; in others, the profit may be meager and long deferred, but broadly speaking, the reward of all this wise foresight and careful preparation has already come. As the *Tageblatt* says in the article quoted at the beginning of this report:

"Our exports reveal no decline, but in some important respects they even show an increase. The manufacturers of machinery are living principally on their work for export to other countries."

The exports of iron and steel during the first six months of 1901 exceed those for the same period in 1900 by 250,000 tons, or 33.6 per cent, and, as a despairing ironmaster of Westphalia has recently declared in an appeal to the Government against the threatened increase in grain duties, "our export trade is the last, best, and only living thing that we have left." It is doubtless true that some of the merchandise exported during the past year has been sold at prices which yielded little if any profit to the manufacturers, but the sales have enabled him to clear away accumulated stocks, recover the cost of labor and materials, and keep his operatives employed, even though at reduced hours and wages. The logical effect of the whole situation is to inspire with new determination those who, in the pending conflict of interests in fiscal legislation, stand for adherence to the policy of commercial treaties based upon reciprocity, the policy which, entered upon a decade ago, ushered

in the golden age of German expansion, progress, and prosperity.

Meanwhile, the revised tariff act, after ten days of debate, which served to show the radical and apparently irreconcilable differences between its advocates and its enemies, was relegated on the eve of the holiday recess to a committee of 26 members, by which it will be considered, modified perhaps in some respects, and returned to the Reichstag at some future time—possibly in May next—for final enactment. From the composition of the committee, an affirmative report on the measure is considered assured.

The debate brought out with great clearness and force what was already plain to every close observer of German political economy—the keen, searching consideration which is given here to everything that relates to the legislation, the industrial progress, and the commercial expansion of the United States. Nowhere is it more clearly recognized than in Germany that the advent of the Republic as a world power of the first rank is the most momentous and far-reaching fact in the economy of the new century. American methods in mining, manufacture, agriculture, shipbuilding, and every change in our fiscal policy are made the subjects of careful and unremitting study. Every friend of both countries will hope that out of the legislation and diplomacy of the next two years may come a broad, liberal, and comprehensive treaty, inspired and shaped by a clear, intelligent understanding of the mutual interests and interdependence of the two nations, under the influence of which the prosperity and reciprocal good will of Republic and Empire will be promoted and maintained.

AMERICAN METHODS IN WIRE WORKS.

Wm. Garrett, of Cleveland, has addressed the following letter to the *Iron and Coal Trades Review*, of London, commenting on some comparisons made by a British iron and steel manufacturer who visited the United States last year:

In your issue of Dec. 20, 1901, I read a very interesting article, entitled "American and British Methods," where Mr. Chas. Dorman gave his experience of his recent visit to the United States, and also remarks made by other gentlemen under the same heading. I was pleased to note that Mr. Dorman corroborated me in the statement I made at the May meeting before your Iron and Steel Institute, that the mills in America were kept constantly in motion, and I wish to say in connection with this that while this was being done in general practice throughout the United States, yet enough men were occupied, so that no one employed suffered from excess of work, men being employed to spell them off, say, every 15 or 30 minutes.

I note also that he refers to the wire rod mill "in Chicago capable of turning out 2,300 tons per week, while at their own works a mill turned out 400 tons per week when it works at its best." He also stated that "at Boston he saw two wire rods rolled at the same time, whereas it took them all their time to look after one rod. These were the only advantages America had in wire rolling so far as he could see. In America the working men were more intelligent than the working men here."

While in the main Mr. Dorman is correct, the mill which he refers to was in Joliet, Ill., and is part of the United States Steel Corporation's plant. This mill has exceeded even the figures that he has named, having produced 877 tons from two finishing mills, with one roughing train, in 24 hours, and while he states that in Boston he saw two wire rods rolled at the same time, yet in order to produce the above quantity in 24 hours, or even 2,300 tons per week in one finishing mill, it was necessary to finish at least five rods at the same time. The ability to roll five rods at the same time on one mill is a great advantage over rolling only one, but in order to do so the shape of the rod as far as roundness is concerned is destroyed, for it is impossible to roll five rods at the same time and produce wire rods that are even approximately round.

Wire rods in the United States are accepted as marketable rods when they are No. 5 one way and No. 7 another. True, in a lot of 1,000 tons quite a large proportion will be 5 by 6, and some may be found 5 by 5. I differ from Mr. Dorman very much when he says that "in America the working man is far more intelligent than the working man here [in England]." It is far from being so on an average. I may say that over 50 per cent of the men employed at this Joliet rod mill are Irishmen and Englishmen, with a few Swedes and Germans added.

Personally, I would not hesitate one minute in guaranteeing a British wire rod manufacturer to build a mill that would produce as many rods as they produce in any mill in the world, and using only British workmen, providing that rods should be considered marketable on the same plan as they are so considered in the United States. If I were asked to say honestly in what branch of the iron and steel industry the British or the European manufacturers were furthest behind, I would unhesitatingly state that it was in their wire mills, beginning with the drawing of the rod. To think that this country is capable of making nearly 2,000,000 tons of rods per annum, and last year made nearly a million and a half tons, the whole of which has been used for every conceivable purpose, and further that these rods were delivered to the wire mill in the shape I have stated above, viz., 5 one way and 7 the other, and have been used successfully commercially and otherwise, it certainly looks absurd for Great Britain, and the combined wire manufacturers of Germany (who may have made one-half of the above tonnage in rods) to pose as arbitrators and judges of what shape and size rods should be, and condemn American practice as being wrong. The egotism on the part of the majority of your wire manufacturers on this point is sublime.

Mr. Turner, in his remarks under the same heading, said that the best men he came across were Englishmen. There is no question upon this point, and while I am not an Englishman myself, yet upon the whole, after what I have experienced among men, I find by far the most intelligent and best workmen are Englishmen. Mr. Turner also added that mischief was sometimes done by snubbing men. This I believe to be one of the greatest evils in the workshops of Great Britain.

I may cite a personal experience in this connection: When quite a young man, and employed in one of the iron works in the West of Scotland, the material we were producing was not marketable. I made a suggestion to the manager, who was also part proprietor, by way of a change, thinking it would remedy the evil. I was insolently told that I was paid for working, while he was paid for thinking, and I was to go and attend to my work. This taught me the lesson never again to make any suggestions to a British manager, so I came to this country, where suggestions from the meanest laborer are received as kindly and as courteously by the proprietor as suggestions from the chief engineer. I do not doubt for a moment the case that Mr. Turner mentioned of the molder who was snubbed in this same way, and who today fills a prominent position in America.

While an American citizen, I still have a great love for my mother country, and I can say, after living in this country 34 years, and noting carefully the qualifications required to make a good workman, that I cannot find anything in favor of the American workman over the British workman, providing the British workman were treated in the same way as his American cousin; and this, too, in spite of my being aware of the fact that the British workmen of today have a great aversion to the introduction of improved machinery. The spirit that has been shown in this direction is the spirit that has been driven into them by the petty tyranny, almost amounting to abuse, in past years by employers, and mainly from petty "gaffers." While this may not be the general rule, it is by no manner of means an exception. In spite of all the talk and boasting of the Americans, on the one hand, and the pessimistic views of some of the British on the other hand, I, for one, firmly believe that Great Britain will eventually assert herself, and once more become, if not the first in the manufacture of iron and steel, pretty well next to that first, which I believe will continue to be the United States.

We have been officially advised that the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has purchased the foundry formerly operated by Caskey Bros., and located within a few hundred yards of the shipyard. The foundry has been closed for about a year and all the foundry work for the shipbuilding plant has been done at other foundries. The plant will be completely overhauled with a view of placing it in operation as soon as possible.

BRITISH ENGINEERS ON GERMAN SHOP METHODS.

During the recent visit of the British Institute of Electrical Engineers to Germany a committee was appointed to record and report upon the more noteworthy features of the establishments selected for investigation. The report covers a wide field and we have selected the following extracts as being of most service to the student of shop management:

For convenience, the matter dealt with has been grouped under the following headings: (1) Financial. (2) Works management: *a*, buildings; *b*, staff; *c*, labor; *d*, treatment of employes; *e*, machine tools; *f*, driving of shops; *g*, miscellaneous.

Financial.

This question possesses considerable interest, as, at the time of the institution visit, the German electrical industry was passing through a severe financial crisis. It would appear that the German group banking system, while enabling firms to start with ample capital, and therefore also with well-equipped works, has the disadvantage of fostering over-extension and over-production to such a degree that a period of trade depression becomes hard to face. The early summer of this year saw the collapse of two important industrial banks, and with them of one well-known electrical firm. A strain was thrown upon the whole industry, and under the circumstances it seems doubtful whether the system is really such an unmixed blessing as some would appear to suppose. The large and well-equipped works which are possible under this system have, of course, the advantage of reduced shop and management charges. Furthermore, specialized machine tools can be economically employed, and the staffs can be more highly paid, while the heads of departments may specialize to a greater extent. Whether, however, there is much gained in this direction after a certain size has been reached, would appear doubtful.

The financial relations which exist between the manufacturers and the banks on the one hand, and their customers on the other, would appear to be so extremely complicated that progress is to some extent retarded, though the system undoubtedly enables experiments to be carried out on a much larger scale than would be otherwise possible. It is a very noticeable fact that the consulting engineer occupies a much less prominent place in Germany than he does in this country, owing, it would seem, to the same cause. It might almost be said, in fact, that the entire consulting work of Germany is carried out by two engineers, one of whom, be it stated, spent the greater part of his professional life in England.

Works Management.

(*a*) Buildings.—Large works follow from large undertakings. There are two distinct ways of erecting large works. Of the first of these, which consists in building one large shop, the Allgemeine Elektricitats Gesellschaft of Berlin is a typical example, while Messrs. Schuckert's Nuremberg factory may be taken as representative of the plan of splitting up the works into several relatively smaller buildings. Each system has its advantages, and up to a certain size, no doubt, the ease with which material can be handled and transferred from one department to another, the accessibility of every department, and the general compactness, tell in favor of the first method. After a certain size, however, these advantages are less marked, and against them must be set the fact that it is almost impossible to extend one department without in some way encroaching upon another. Further, there is more chance of friction between neighboring heads of departments where boundaries are to a large extent imaginary. It may be of interest to note that in America the Westinghouse Company lean to the large building plan, while the General Electric Company split up their works, on the second principle mentioned.

As regards the organization of departments, again two methods are possible. Firstly, certain articles can be manufactured throughout in one department; or, secondly, all work of a similar nature, no matter for what purpose, can be carried out in the same department. Of the first system, the Union Elektricitats Gesellschaft of Berlin would appear to be the best example, while perhaps the Allgemeine Elektricitats Gesellschaft instrument factory in Akerstrasse, Berlin, and Messrs. Siemens & Halske's telegraph factory in Markgrafenstrasse might be included. The second method, however, seems to be by far the most general.

(*b*) Staff.—One of the most noticeable features in all the works visited was the very large engineering staff employed. Out of five firms of whom inquiries were made on this point the following were the proportions of staff to employes: 1 to 20; 1 to 7; 1 to 10; 1 to 13; 1 to 20. It was somewhat difficult to find out exactly what was meant by "staff," and it is possible that the above figures in many cases include some of the commercial department. Probably, however, after making all allowances, the average proportion would be one engineer to every ten men. The above figures do not include foremen, but engineers only. In the case of one of the largest firms, the foundry, which employs 200 men, has a technical staff consisting of a director, two assistant chemists, and two assistant electricians, to say nothing of the usual clerks and foremen. The only explanation of these large staffs is either that the work done per man is less than with us or that much greater care is given to experimental detail and general testing. While the first explanation is no doubt in part correct, it is to be feared that the second is the main cause.

Throughout some works small test rooms were to be found scattered about, in which the various parts were carefully tested electrically as well as being merely "inspected." The result has been found to be a great saving of labor in the end. It may be mentioned that owing to the excellent preliminary education obtained by all classes, and to the great facilities given for technical education, the competition for subordinate posts of this description is great, and salaries are correspondingly small.

A point of interest is that in most drawing offices the draughtsmen are distinct from what may be termed "calculators," who collect and prepare for use by the draughtsmen the various data required. The mere recording of undigested results being of small value, the "calculator" would appear to be a most useful innovation.

Another cause for the large staffs is that, as previously stated, much of the work done in England by the consulting engineer is in Germany carried out by the contracting firm. As an example, it may be mentioned that the design of the overhead permanent way construction for the Berlin elevated railway was got out by Messrs. Siemens & Halske's drawing office. While the commercial and technical departments appear to be kept quite separate, the head of each department is chosen for his commercial as well as for his technical abilities. The sales department appears usually to be in touch with the works only through the medium of the firm's catalogue. The staff hours are from seven to seven and a half hours per day.

(*c*) Labor.—Much difference of opinion seems to exist as to whether the German mechanic shows, or does not show, that soldier-like smartness and discipline with which he is usually credited. It was generally acknowledged that the output per man is less than that in England, while a considerable time seems to be wasted both in getting to work and in leaving off. Time recorders were noticeable in nearly all the shops visited. As to the hours of working, in Berlin itself nine or ten hours, with two hours off in the middle of the day, would appear to be the rule. In the outskirts of the town there is a nine or ten hours day, with two breaks, of three-quarters of an hour and half an hour respectively, while in the country eleven and twelve hours' work is still usual.

Little information is available as to the rate of wages earned by mechanics, but the following wages paid at the Berlin Central Station, working 10-hour shifts, may be of interest: Drivers and dynamo attendants receive 4d. to 4¾d. per hour; stokers, 4¼d. to 4½d. per hour; switchboard attendants, 4½d. to 5½d. per hour; unskilled labor, 3⅗d. per hour. It may be mentioned that dynamo attendants and drivers are not above cleaning their dynamos and engines, and even scrubbing the floors of the engine-rooms. Piece work seems to be very little used, day work being almost universal. As a rule each man appears to work two machine tools, while in one instance a man was attending to no less than six. Female labor is extensively employed, but no data as to wages are available.

(*d*) Treatment of Employes.—Large and comfortable dining-rooms, etc., are invariably set apart for the staff, but the most noticeable feature is the great care and thought devoted to the safety and comfort of the men. First, every precaution is taken in the way of guarding and fencing in the machines,

the law in this respect being very stringent; and, secondly, every convenience is provided to enable the men to wash and get tidy before leaving the works. Besides washing arrangements at various points about the works, a locker (preferably provided with wire netting sides so as to be open to inspection) is allotted to each man in which to leave his clothes, and one firm at least allows its men ten minutes of its own time for washing, etc. Reading-rooms and various clubs are organized, and in winter coffee can be obtained in each shop. The catering for the latter, which was undertaken at first by the firm, has since in most cases been taken over by the men.

(*e*) Machine Tools.—Most of the works are well equipped with machine tools capable of dealing efficiently with large work, but the tools for medium-sized work appear less suitable and not as a rule particularly well handled. There was an almost entire absence of automatic machinery, which considering the large size of the works and the high pitch to which standardization has been pushed, would appear strange were it not for the low rate of wages which prevails. What machine tools were seen appeared to be built on the American lines of cheapness combined with strength sufficient for a few years, after which new and improved tools would be bought.

A neat magnet for holding iron castings onto a milling or planing machine was shown. It consisted of an electro-magnet, the poles of which were cut into the shape of teeth and almost touched one another, being kept apart by a strip of brass following the curve of the teeth. The work was subsequently demagnetized by an alternating current. A similar arrangement was seen in the form of a magnetic lathe chuck.

In one of the works the counter shafting, driving lathes, etc., were all so fixed as to be readily movable along girders fixed to the ceiling, so that they could be moved to suit new machines as required.

(*f*) Driving of Shops.—The usual practice would appear to be to use direct-current motors for this purpose, though the Allgemeine Elektricitats Gesellschaft employ 3-phase motors throughout, even for cranes, where a torque of two and a half to three times the normal is said to be obtained at starting without an excessive current. Whether the load is rigidly coupled to the motor or is driven through a springy coupling could not be definitely ascertained.

Small induction motors have as a rule short-circuited rotors and wire resistances in the stator, while large motors are started by liquid resistances, usually in the rotor circuit. These resistances generally consist of lead plates dipping into iron vessels containing the electrolyte which forms the neutral point of the system. When right down 3-switch contacts short circuit the whole resistance. A solution of soda is the liquid most generally used. Although the more general practice seems to be to employ a separate motor for each machine, some prominent exceptions were noticed. The feature of the machine tools at the Dresden Railway repairing shops were the speed cones. One set of cones is mounted on an adjustable frame which can be screwed up nearer to the second cones when required, so as to leave the belt slack for changing. The drive is in this case only 2 ft. to 3 ft.

As regards motor-starting switches, there appears to be more metal employed than is usual either in this country or in America. Less attention is given to finish, but the whole construction seems more massive. In the case of one particular crane starter, the switch contacts consisted of blocks of carbon and copper pressed into a solid mass.

(*g*) Miscellaneous.—The drawings employed in the shops of one firm were inked and colored and mounted upon thick millboard about 4 feet square. In most of the other works visited, unmounted blue prints, say 3 ft. by 2 ft., were used. In one works neat celluloid cases were used, into which the drawings could be slipped and so kept clean. The general impression gathered appears to be that everything looked as though it had been specially made for the particular purpose in view, and not simply built up out of materials at hand. In other words, nothing in the nature of a makeshift was to be observed.

Different works appeared to have had different objects in view, some seeming to strive after neatness and workmanlike finish, others after solidity, and others again after cheapness of manufacture. Throughout it was noticeable that less attention was given to minute details of heating and efficiency, such as often loom so large in our own specifications, but rather to general adaptability, price being considered at any rate as an important feature, if not as the most important feature.

SUGGESTED AT THE SHOP.

BY F. O. REMAN.

The manufacture of electrical apparatus is, to my mind, one of the most interesting examples of rapid mechanical growth. The time was ripe for it and the prevailing ignorance of the true nature of electricity did not hinder the sprouting of the industry. Everybody has a thoroughgoing acquaintance with steam, and away back beyond the early days of the oldest inhabitant, the production of steam and a knowledge of its useful properties has been common property. Contrast steam and electricity; the everyday and time-worn story of the one and the mysterious character of the other; the slow laborious development of steam engineering and the lightning-like outburst of the industrial mechanism conveying and controlling electricity. Machinery had advanced to a degree of perfection that paved the way for the crowding of improvements in light and power generation into mechanical forms and today electrical development is largely a machinery affair, a matter for the machine shop as much as though it were the case of a steam engine.

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When anything is got at in a hurry there is a tendency to jump fences and cross lots. It is a case of get there quick and haste is not easy traveling over new ground. I take it that some things might have been done differently if the job were to be started brand new under easier conditions and less of the slap-dash lashing into shape that afflicts the improvement long held up in a laboratory and suddenly bounced into the world by impatient capital. It may be far from correct but it always looks to me that that was the experience of the telephone. I don't know any more delicate machine than the one which links together the business chain and operates with such accuracy and speed. The story of the telephone is an entertaining one; either as regards the numerous attempts to make it a success, the many inventors who came within an ace of getting fame and fortune, or the peculiar problems incidental to its electrical genesis.

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Just now I am not concerned with these things. The fact is the superintendent has a new desk telephone, and I am thinking what sort of a machine we should have had on his desk and on the walls of the office if the telephone had got into the hands of a good mechanical engineer a little earlier in its history and before the scheme had sort of crystallized into a form not to be molested later. As a machine it conveys sounds with surprising faithfulness, and the familiarity with the instrument spoils much of the appreciation that rightfully is due it. The essential feature of a machine is that it shall do work and after it is capable of doing the work it is made to do it more conveniently, quicker, with less wear, etc., and efforts toward this end are the sharp spurs of competition in business.

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But the wall flower of telephony is always the same. There is no reason why the receiver should be held, and any designer of machinery could contrive a means whereby the message could be heard without supporting the instrument by hand. A hinge, a jointed rod or a slide, would allow the telephone to be placed in position for the listener, and the movement could have the same electrical effect as the present contrivance. This would give the user of the 'phone free use of both hands and the making of memoranda would be an easy task.

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This scribbling of notes, however, could not easily be done with the help of the little desk, which placed under the transmitter of the 'phone looks so neat and thoughtful a provision. That desk is a humbug. It is the ledge where papers may rest unseen as the connection of the transmitter cuts off the view. Had the transmitter been attached to the rest of the instrument by a more nearly vertical bracket, there would have been room above for a ledge on which a pad could rest and notes be taken with some degree of comfort.

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The desk instrument is even worse, from my point of view. Only on the assumption that a fair degree of practice with

dumb-bell exercise, or the necessity of an absurdly heavy paper weight will excuse the ponderous mass of metal. Maybe the weight is studiously great in order that the thing will not be lifted, and therefore, will not be flung on the floor or anywhere else. But it does not work this way in practice, and it comes out from a corner whenever used and I have seen the abled bodied swing the two halves of the instrument until the talk petered out. There does not appear any valid reason why the instrument could not be lightened up and fastened to the desk so that the careless and unfortunate would not fling it on the floor and thus cut short its usefulness. If it is found desirable to hold the receiver of the desk instrument then why not attach the mouthpiece of the transmitter to the same device and this would require but a single hand and the other could at least be shaken at the distant speaker if no better service is to be made of it. The whole thing seems feasible for arrangement so that the device would be maintained in position with no further assistance from the hands after the first adjustment, and this would give a more convenient form of instrument than we can now enjoy.

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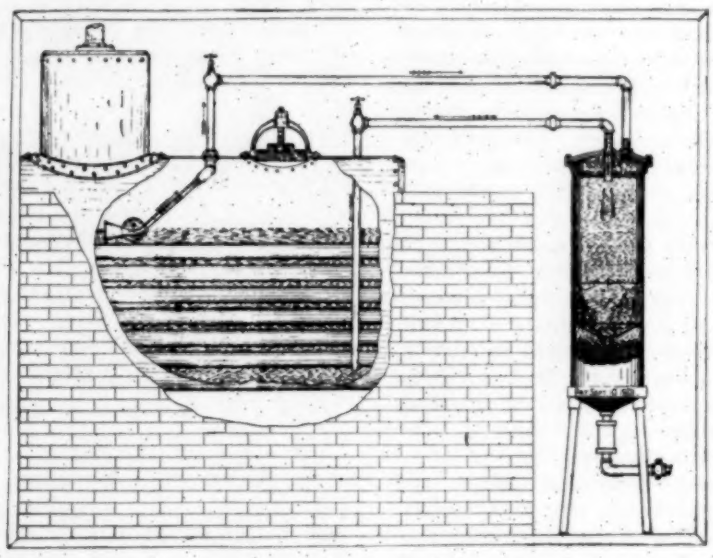
This may look like a wholesale criticism of an exceedingly useful device and I fear I have not covered all the objectionable points by any means. Just the same the hello box is one of the things we should discard with difficulty in any business and knowing its worth I can only regret that the modern designer of mechanism did not have the scheme in hand earlier in the game. How much better he would have made it is purely a matter for conjecture, but that he would have left it in its present shape is manifestly out of the question.

THE BUCKEYE BOILER CLEANER.

The accumulation of scale and sediment in a boiler is a constant menace to life and property. The water holds in solution mineral matter and when heated to a temperature sufficient to generate steam these impurities are usually deposited upon the inner surface of the boiler and around the tubes. The intervention of this coating between the water and the heated iron greatly diminishes the effective force of the applied heat, and with the loss of heat occasioned by the presence of scale comes the danger of overheating the boiler when raising the temperature to a degree necessary for steam generation. The accumulation of sediment and scale in a boiler not only increases the amount of fuel required in a given time but also tends to shorten the life of the boiler by the gradual overheating and consequent weakening of the plates due to the absence of that close contact of the water and the plates always desirable in a steam generator.

The device illustrated in the engraving has been gradually developed by way of the stationary skimmer and the surface blow-off cock and is designed to remove impurities from the water, discharge them into a settling chamber and return pure water to the boiler. The floating impurities are collected by the wide-mouthed funnel and pass through the tubular arm and flexible joint to the outside piping through which it is conducted to the precipitator. Here it is discharged into the receiving chamber between the top head of the precipitator and the head of the inner tube. There being a larger body of water longer removed from the boiler (and consequently cooler) below the head of, and in the inner tube, the incoming water is cooled a few degrees and then passes out through the perforations and downward between the inner tube and the main shell until it reaches the lower end of tube when it changes the direction of its flow to an upward course while the sediment separates from it and continues to settle and is collected in the sediment chamber below. Owing to the unequal pressure in the boiler, a continual circulation is kept up through the skimmer and precipitator, and as long as the boiler is making steam the process of skimming is continued.

A considerable variation in the water level will not affect the efficiency of this skimmer because the latter is adapted to rise and fall with the changing water level. This flexibility, which is of great advantage in the case of water tube boilers, is secured by means of a pipe with knuckle joints which permit the skimmer to accommodate itself to any ordinary working level.



THE BUCKEYE BOILER CLEANER.

The skimmer is a wide mouthed funnel suspended by a tubular arm or skimmer pipe through which the impurities pass from the boiler to the settling tank situated outside the setting. The floats attached to the skimmer keep the latter submerged to the same depth regardless of the height of the water level, thus providing a uniform area of opening to receive the scum on the surface. The movable arm or skimmer pipe is provided with a regrinding joint with a suitable taper to prevent sticking, and if for any reason it should begin to leak it may readily be ground to a perfect seat.

The longer a boiler can be run without cooling down for the purpose of cleaning and yet be able to keep it reasonably clean, the better it is for the boiler. The mechanical cleaner, by constantly removing a large percentage of the impurities in the form of scum, tends to lengthen the periods between cleaning times and thus indirectly adds to the durability of the boiler.

This device is manufactured by the Buckeye Boiler Skimmer Co., 15 South Water St., Cleveland.

The new rolling mill of the Carpenter Steel Co., at Riverside, near Reading, Pa., is fast nearing completion and will be placed in operation shortly. The mill is being equipped with two trains of rolls.

In the past two weeks the plant of the Waukesha Sheet Steel Co., Waukesha, Wis., has been compelled to close down several times on account of the scarcity of fuel. For some time also only one mill has been in operation.

NEW BLAST FURNACE AT SOUTH CHICAGO.

For some time the blast furnace capacity in the Chicago district has been inadequate to supply the demand for local foundry irons. The second Iroquois Furnace completed last year and only started in January, will correct in part the disparity between supply and demand in Northern irons. Still another addition is to be made. The South Chicago Furnace Co., which was organized in 1899 to buy the Calumet Furnace, will begin work at once on a furnace that will have a capacity of 350 tons of foundry iron a day. It is expected that the furnace, which will be modern in all particulars, will be ready for operation within a year. The company, as appears on the accompanying map, has its own docks and receives ores direct from the vessel. The additions to furnace capacity made by the Illinois Steel Co. and the Iroquois Furnace Co., with that planned by the Chicago Furnace Co., make South Chicago vastly more important as a pig iron producing center.

Obituary.

John S. Williams, treasurer and general manager of the Forest City Steel & Iron Co., of Cleveland, who died Thursday, Feb. 6, aged 40, had achieved an enviable business reputation in spite of the handicap of ill health. He was a member of the Chamber of Commerce and of the Civil Engineers' Club of Cleveland. His father, J. C. Williams, is president of the Forest City Steel & Iron Co.

Oscar M. Burke, one of the founders of the Lake Shore Foundry, of Cleveland, now one of the plants of the United States Cast Iron Pipe & Foundry Co., died on Wednesday, Feb. 5, aged 79 years. In the 50's he was secretary and treasurer of the Cleveland & Mahoning Railroad, the first railroad between Cleveland and Youngstown. In 1873 he organized the Lake Shore Foundry Co., of which he was president until its absorption by the consolidation. He leaves two sons, Clarence E. Burke, of Orange, N. J., formerly vice-president of the United States Cast Iron Pipe & Foundry Co., and Frank G. Burke, a manufacturer, of New York.

Frederick Jarecki, of Erie, Pa., a well known inventor and a member of the Jarecki Mfg. Co., died on Feb. 6.

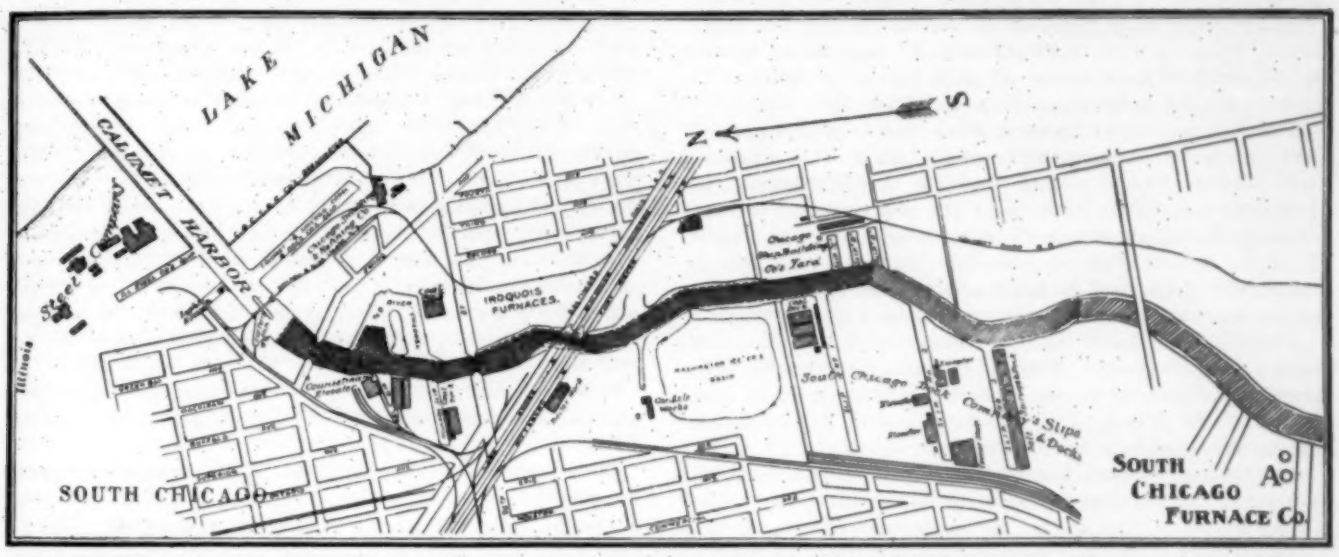
Larger Facilities for N. & G. Taylor Co.

N. & G. Taylor Co. announce the removal of their general offices to the Mariner and Merchant Building, corner Chestnut and Third streets, Philadelphia, where they have had offices fitted up for their use. This change is necessary for their rapidly growing business in the enlargement and development of their tin plate plant; for their trade in open hearth soft steel sheets for stamping purposes, and for their business in plate iron and steel, from their works at Cumberland, Md. Their minor offices are transferred to their tin plate works at Tasker and Swanson Sts., Philadelphia, where they have also erected warehouses for the proper handling of goods. Their tin plate departments have also been enlarged, and a new smelting works, to meet the increased demand for their makes of solder, babbitt metal, etc., has been built.

This house was established in 1810, doing business at that time in the old district of Kensington; subsequently they removed to Second street above Race; then to Third street above Race, when in 1845 they built the premises on Branch street, which they are now vacating. They have had a continuous existence of 92 years as a firm, being the oldest firm in their line in the United States. They are the sole manufacturers of the Taylor Old Style brand of hand-dipped roofing tin. This old fashioned tin is made the same as the first roofing tin ever made in Philadelphia, which was in 1830, and sold by them at that time. The Taylor Old Style brand covers many prominent buildings throughout the United States. The makers received medals for tin plates of high grade manufacture at the Franklin Institute Exposition in 1874, at the Centennial Exposition in 1876, and also at the National Export Exposition held in Philadelphia in 1899.

The Widening Use of Mechanical Stokers.

Some measure of the extent to which mechanical stokers are now being applied to steam boilers is furnished by what is being done in connection with several of the large power houses at present going up in New York, as told in Cassier's Magazine for February. At the Manhattan Railway power house the total installation, when the plant is completed as designed, will be 384 stokers attached to ninety-six 525-H. P. boilers,—a total of 50,400-H. P. The present installation of 256 stokers on 64 boilers, figuring up 33,400-H. P., will be equaled by the new plant now being erected for the New York Edison Co., comprising 35,000-H. P. of boilers with 244 stokers, while two other large plants under construction,—the Third Avenue Street Railway Co.'s station and that of the Metropolitan Street Railway Co.,—will have respectively 31,500-H. P. and 25,000-H. P. of boilers all fed by such stokers. The saving of manual labor by these equipments is an item of no mean importance, though it is only one of the advantages.



MAP SHOWING THE IRON, SHIPBUILDING AND OTHER INDUSTRIES ALONG THE CALUMET RIVER, SOUTH CHICAGO. A IS THE LOCATION OF THE PROPOSED NEW FURNACE OF THE SOUTH CHICAGO FURNACE CO.

The Wisconsin Bridge & Iron Works, Milwaukee, Wis., has prepared plans for the Filer & Stowell Mfg. Co., Milwaukee, for a new foundry, 250x350 feet, to be built on Lincoln avenue and Beecher street.

Five shiploads of harvesting machinery will leave for Russian ports this month, the cargoes to consist of reapers, mowers, binders and rakes manufactured by the McCormick Harvesting Machine Co., the Deering Harvester Co., and the Plano Manufacturing Co., Chicago; the Johnston Harvester Co., Batavia, N. Y., and Aultman, Miller & Co., Akron, O. The first of these departed last week with a cargo of machinery that consisted of 10,000 tons of harvesting machines, mowers and rakes, 9,000 of which were from the McCormick works.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

The Modern Iron Works, of Quincy, Ill., has been incorporated with $50,000 capital. A new plant will be built for the manufacturer of plumbers' supplies. E. L. Walcott, R. V. Clark, A. J. Niemeyer, H. A. Oenning, E. Best, George Fischer and B. G. Vasen are the incorporators.

The Sintz Gas Engine Co., of Grand Rapids, Mich., has increased its capital stock from $50,000 to $100,000.

The Best-Scott Foundry Co. has been organized at Warren, Pa., for the purpose of making iron castings of all kinds. John Best has been elected president; J. A. Viele, New York, secretary, and Robert Scott has been elected manager.

The United States Coal Co., of Cleveland, O., has been incorporated with $2,000,000 capital. The new company will develop an 18,000 acre coal tract in Jefferson county, O. G. B. Siddall, S. A. Quail, J. M. Henderson, L. S. Rommassen and John MacGregor.

The Sharon Foundry Co., Sharon, Pa., will apply for a charter on March 3, with an authorized capitalization of $250,000. The new company will manufacture steel castings. James P. Whitla, W. W. Shilling and Joseph Riddle are the promoters.

The machine shop operated by Warren & Smith at Fairhaven, Wash., will be combined with the Reid Boiler Works at the same place and a new company will be incorporated to operate the two with a capitalization of $30,000.

The Tacoma Co., of Tacoma, Wash., has been incorporated with an authorized capitalization of $25,000,000. The incorporators are Henry Hewitt, A. M. Ingersoll, C. W. Thompson, A. J. Hayward and J. B. McIntyre. The new company will endeavor to bring about a working agreement with the Pacific Steel Co., whose plant is located at Irondale, Wash. It is the intention not only to build a large iron and steel plant but to also operate mines and smelters on copper ores.

The South St. Louis Foundry Co., of St. Louis, Mo., has been incorporated with $100,000 capital to operate an iron foundry at South St. Louis. Robert J. Kilpatrick, F. M. Kilpatrick, S. M. Wood, C. P. Kilpatrick and E. Kilpatrick are the incorporators.

The Central Foundry Co., of New York City, has been incorporated with $100,000 capital. J. H. Walters, Jr., J. S. Dibley and H. W. Letcher are the incorporators.

The American Metal Cross Tie Co. has been granted a New Jersey charter with $50,000 capital.

B. M. Everson, German National Bank Building, Pittsburg, is in the market for two or three second hand jacks from 30 to 50 tons capacity, either ratchet or hydraulic. He will also buy a five to eight ton chain block, second hand.

W. W. Sproull, 208 Third Av., Pittsburg, is in the market for a small generator for about 20 lights, also a small air compressor.

The American Foundry & Machine Co., of Hanover, Pa., has been granted a Pennsylvania charter with $100,000 capital. T. H. Brown, H. N. Gitt, J. H. Bittenger, D. M. Newcomer, C. J. Delone and A. R. Brodbeck are the incorporators.

The Wright Soper Roller Bearing Co., of Albany, N. Y., has been incorporated with $900,000 capital to manufacture roller and other bearings for tools, machinery and other apparatus. L. G. Bennett, W. H. Wright, C. G. Smith, E. A. Georger, J. P. Wood, A. G. Thorne, and W. B. Philpott Jr., are the incorporators

The National Steam Economizer Co., Springfield, Mass., has recently reorganized and will establish a plant with a capacity of 300 machines per annum, employing 60 to 100 men. The board of directors consist of B. D. Rising, W. F. Callender, C. K. Fankhauser, R. H. Smith, Fred T. Ley, C. A. Royce and R. C. Cooley.

Roth Brothers & Co., Chicago, manufacturers of electric motors, dynamos, etc., have been incorporated with a capital stock of $25,000. The incorporators are Alfred G. Roth, Charles H. Roth and Gustav A. Roth.

The South St. Louis Foundry Co., St. Louis, Mo., has been incorporated with a capital stock of $100,000.

The Federal Automobile Machine Co., of New York, has been incorporated at Albany, N. Y., with a capital stock of $150,000.

The Mfg. & Selling Co. of America, has been organized under a New Jersey charter and will manufacture iron, steel, zinc, tin, etc. The principal office is located at 122 Roseville avenue, Newark, N. J., and the incorporators are: Thomas J. Molloy, Willis G. Townes, C. P. Anderson and Samuel M. Green. Capital stock, $500,000.

The New Castle Forge & Bolt Co. held their election of officers and directors recently. Frank Ryman was re-elected president, and all the other officers and directors were re-elected, as follows: Hon. J. Norman Martin, secretary, and H. B. Whieldon, treasurer; directors, Frank Ryman, W. H. Cox, J. Norman Martin, A. B. Whieldon, C. J. Kirk, T. F. Morehead and John C. Roberts. W. H. Cox was elected vice-president. The machinery is now being placed.

R. S. Warner, of Columbus, O., recently spoken of as at the head of a movement for a steel foundry, plate bar and angle mill, is planning to build near the works of the Rarig Engineering Co., in that city. The land has been optioned by A. K. Rarig for the purpose of locating the plants, and the purchase will be made at once. The location has four steam railroads: Pittsburg, Cincinnati, Chicago & St. Louis, Baltimore & Ohio, Toledo & Ohio Central, and Columbus, Sandusky & Hocking, also an electric street car line, giving transfers to all parts of the city.

The American Foundry & Machine Co., of Cleveland, recently incorporated with $200,000 capital stock, has organized with the following officers: C. H. Lane, president; W. W. Wallace, vice-president; C. H. Marr, secretary-treasurer, all of Cleveland. The company has obtained a bonus from the town of Ravenna, Ohio, and is erecting a plant in that place on the site of the old American Window Glass factory. The site consists of 8 acres on the Pennsylvania tracks. For the present the buildings will consist of a main foundry building 125x72 feet, machine shop 130x88 feet, and a power house. The firm will manufacture a line of mining machinery and undertake custom work in the foundry. Contracts have been placed for a portion of the equipment, but orders are still to be given for boilers, generators, planers, lathes, 10-foot boring mill, etc.

It is said that Ben Catchings, of Birmingham, Ala., is organizing a $75,000 company for establishing a rolling mill at Tuscaloosa.

The Parkersburg Iron & Steel Co., W. Va., is proceeding with the construction of its new plant; four mills are in operation, producing high-grade sheets from 16 to 30-gage up to forty-two inches wide, and two additional mills are under construction (with space for six more mills in main building); seventy tons daily is the capacity of the six mills. A building 110x225 feet will be erected for skelp and bar mill; a forging department to make hammered iron blooms will be installed; a tin dipping plant; and the Budke Mfg. Co.'s stamping plant the company has bought and will remove from Canonsburg, Pa. Permanent organization consists of H. H. Nieman, president; D. F. Budke, manager of works, and A. H. Geilfuss, secretary; capitalization is $500,000, with $400,000 issued; offices in Times building, Pittsburg, Pa., and after April 1 at Parkersburg.

The Neches Iron Works, Beaumont, Tex., has been incorporated with capital stock of $50,000, by W. A. Fletcher, E. A. Fletcher, M. K. Fletcher and others.

Proposals will be received for 30-horsepower gasoline engine to be erected at Big Run, Pa.; for 45-horsepower boiler and 30-horsepower engine (second-hand), all fixtures, ready to run; also for two 24-foot steel shafts (forty-eight feet) two and seven-sixteenths inch, with connections. Address, Ernest M. Fischer, Wellsboro, Pa.

The Monumental Mfg. Co., Baltimore, Md., has been incorporated with capital of $50,000, for manufacturing tin specialties, by Jacob W. Hook, Walter Snyder, C. Howard Hook and others.

The Wilkes Foundry Co., of Toledo, O., have been incorporated with $25,000 capital stock by Charles T. Wilkes, Thomas Davies, Wm. E. Brown, George M. Kinney, and M. J. Riggs. Plans for a foundry building 400x300 feet have been completed. Erection of the plant will start at once, and the company expects to have it in operation by May 1.

Bids will be received up to Feb. 19 by T. A. Steel, president

of the council, Cuyahoga Falls, O., for furnishing and installing an alternating current generator, 90 to 120-kilowatt, and a horizontal, medium or high-speed engine of not less than 200 indicated horsepower.

New York parties are looking over the field at Austell, Ga., with a view to establishing a foundry to cost $100,000.

The Bradford Gas Engine Co., 211 Market street, Camden, N. J., will manufacture engines with a capital stock of $50,000. The incorporators are: F. H. Fox, Z. T. Klinger, W. F. Flickinger, Samuel Noae, E. E. Clark and John O. Wilson.

The American Type Founders' Co. has bought a tract of land in Jersey City, N. J., comprising fifty-two city lots, on which the company proposes to build a large plant.

Bids are invited for furnishing material and erecting repair shops and storage tracks for the Rockford Railroad, Light & Power Co., Rockford, Ill.

The Kirk-Latty Mfg. Co., of Cleveland, has increased the capital stock from $75,000 to $150,000. F. W. Kirk is president. It is understood that the firm is preparing to manufacture automobiles.

Fires and Accidents:—

The old Whiteley plant in Springfield, O., was almost completely destroyed by fire on Feb. 10. The buildings were all under one roof and extended 600 feet along East street and 1,200 feet along the railroad. The structure was occupied by a number of firms, the list including the Grant Axle & Wheel Co., loss $65,000; the Green Mfg. Co., loss $12,000; Springfield Foundry Co., $15,000; Indianapolis Frog & Switch Co., loss $5,000; Miller Gas Engine Co., loss $50,000; Owen Machine Tool Co., loss $40,000, and the Progress Furnace & Stove Co., loss $30,000. The entire force thrown out of employment will number 685, and the estimated loss will amount to $752,000.

A fire in the nickel plating plant of the Stover Mfg. Co., Freeport, Ill., on Sunday, Feb. 2, at the old works, resulted in the loss on building and contents amounting to $6,000 to $8,000, fully covered by insurance. The origin of the fire is unknown, except that it may have resulted from an effort made in the morning by some of the men to thaw out the pipes used for heating the building. New machinery will be purchased and set up in the factory now being vacated by the removal of machinery and stock to the new plant, and for the present these buildings will be used for the nickeling department. The fire affects the hardware department of the business only and will not delay operations outside of the nickeling department, and here only for a comparatively short time.

New Construction:—

The A. P. Wagner Tool Works, of Sydney, O., manufacturers of machine tools, lathes, etc., will remove to Detroit shortly and will occupy the buildings of the Universal Elevator Co. The main building is 144 feet long and 96 feet wide at one end and 60 feet at the other. An addition will be erected to this building in order that it will be 96 feet wide its entire length. Additional buildings for the plant will be built shortly.

Mayer Bros., founders and machinists, Mankato, Minn., will erect a new machine shop 60x200 feet within the next two months. The company is now in the market for general machine shop equipment including cranes, lathes, etc.

The proposition to erect a blast furnace for the production of foundry iron is being considered by the business men of Canton, O. If the furnace is built it will have a daily capacity of 250 tons.

The Hewitt Manufacturing Co., Chicago, Ill., will erect a brass foundry, 250x150 feet. A portion of the building will be two stories in height while the portion of the building containing the foundry proper will only be one story high.

The National Iron & Wire Co., Cleveland, O., will erect a modern structural and bridge shop adjoining its present plant. The new building will be two stories high, 75 feet long and 50 feet high.

The Ferris Clevis Co., Oshkosh, Wis., will erect a malleable foundry at a cost of $15,000.

The Allis-Chalmers Co., of Chicago, Ill., has decided to erect two additional machine shops at West Allis, Wis.

The Philadelphia Pneumatic Tool Co., Philadelphia, Pa., will increase the size of its plant by the addition of two new buildings. The one building, one story high will be 130 feet long and 96 feet wide while the other building, a boiler house, will be 22x43 feet.

The new shafthouse the Cleveland Cliffs Iron Co. is to build at the Ashland mine, Ironwood, Mich., will probably be of steel.

The Pennsylvania Co. will enlarge its shops at Columbus, O., and Allegheny, Pa., spending $500,000 on the former and $300,000 on the latter. Among the improvements at Columbus will be a new coal wharf, an ash-pit, an erecting shop and an addition to the present machine shop, and a new power station. The erecting shop will be 80x60 and will be equipped with two 75-ton cranes; the addition to the machine shop will be 61 feet long. The new power station will replace the two power plants now in use.

At the Michigan Central shops at Jackson, Mich., the machine erecting shop will be increased by an addition 360 feet long by 140 feet wide, with longitudinal erecting tracks. This new shop, which is at right angles and joins the present erecting shop, is served by overhead traveling cranes capable of lifting the largest engines. Overhead cranes will also be put in the present erecting machine shop and boiler shop. Four small isolated boiler plants in different buildings will be replaced by a new central lighting and powerhouse, 85x90 feet, and all the shop tools, cranes, transfer tables and turntable will then be driven by electric motors.

An addition, 38x100 feet, will be built to the plant of the Petroleum Iron Works, Washington, Pa.

The Heine Safety Boiler Co. will erect an addition, 109x100 feet, to the shop at Phœnixville, Pa.

The Continuous Rail Joint Co. of America, Newark, N. J., is contemplating the erection of a rolling mill in that city. Plans have been prepared for a complete mill and options on land with shipping facilities are being sought. About 30 acres will be required for buildings, tracks, etc. At present the manufacturing is done at Troy, N. Y., and near Chicago. Robert Gray, Jr., president, and Frederick T. Fearey, treasurer, have the matter in charge.

The Modern Steel Structural Co., of Waukesha, Wis., have the contract for structural steel work on the foundry, 300x112 feet, and power house, 40x120 feet, for Williams Bros., Minneapolis, Minn., after plans by C. A. P. Turner, Phœnix building. The equipment will include two 10-ton traveling cranes and two 10-ton hydraulic cranes.

Very little new equipment will be required by the Insinger Co., Philadelphia, for its new shops. Plans are prepared and call for a two-story brick machine shop, 50x125 feet, and boiler house, 20x29 feet.

Nimmons & Fellows have finished plans for a one-story machine shop, 100x100, which the Morden Frog & Crossing Works will build in connection with its plant at South Chicago. It will cost $12,000.

The Crucible Steel Co., Pittsburg, has let the contract for a bridge to span the Monongahela river and connect the company's works at Clairton with the Pennsylvania and the Pittsburg & Lake Erie railroads.

The Midland works of the American Sheet Steel Co., at Muncie, Ind., have been much improved during the past six months, and other improvements are under way. A new trimming house is being erected and the plant is being equipped with special machinery for the manufacture of high grade sheets. The plant is now operated almost entirely on specialties.

William McIntyre & Sons, of Youngstown, have the contract for constructing five open-hearth furnaces, six annealing furnaces and twelve gas producers for the American Steel Casting Co., at Alliance, O.

Contracts for additions and improvements to the furnaces of the Woodstock Iron Co., J. W. Woolfolk, manager, Anniston, Ala., have been awarded as follows: Boilers, Walsh & Whilton Foundry Co., Chattanooga; castings, Caldwell-Watson Foundry Co., Birmingham.

The Pittsburg District:—

The contract for the structural work on the new Lincoln Av. bridge to be erected in Pittsburg, has been awarded to the American Bridge Co. The cost of the work will reach $70,000.

The U. Baird Machinery Co., of Pittsburg, has been awarded the contract for furnishing the major portion of the machin-

ery for the new plant of the American Turret Lathe Co., at Warren, Pa. This plant was formerly located at Wilmington, Del.

The structural material to be used in the erection of the Farmers' Deposit National Bank building, Pittsburg, will be furnished by the Carnegie Steel Co. About 7,500 tons of material will be required.

Harry L. Irwin has been appointed receiver for Marlin & Co., of this city. The action was an amicable one, the action being best for the creditors. After several large contracts are disposed of the receivership will no doubt be dissolved.

Neal Brothers, operating the Anchor Rolling Mill on the South Side, will install a galvanizing plant shortly. The plant contains two sheet mills.

The American Construction Co., of Pittsburg, has been incorporated for the purpose of doing general construction work. A. Gordon, H. C. Miller and F. M. Sullivan are the incorporators.

The Hunt Foundry & Machine Co., of Pittsburg, has been incorporated with $100,000 capital. The new company is a consolidation of the Hunt Air Brake Co. and the Kensington Foundry Co., of New Kensington, Pa. The capacity of the machine shop will be largely increased, while plans are being prepared for the erection of a foundry on the site adjoining the air brake plant. Temporary offices of the company are located in the Anchor Bank Building.

The Pittsburg Machine Tool Co., of Allegheny, Pa., last week shipped 21 lathes to Manchester, Eng., for the new plant of the British Westinghouse Co.

The McKenna Brass Co. will erect a large warehouse adjoining its new plant on First Av.

The St. Clair Furnace Co., one of the subsidiary companies of the Crucible Steel Co. of America, has awarded the contract for its ore handling machinery for its new furnace plant at Clairton, Pa., to the Brown Hoisting & Conveying Machinery Co., of Cleveland, O. The plant will consist of a car dumper, two bridges and ore and coke bins each 700 feet in length. The contract for the erection of a bridge across the Monongahela river to connect the plant with the river division of the Pennsylvania railroad, has been awarded to the American Bridge Co. The bridge will be nearly 1,000 feet long and the cost of the structural work will amount to about $600,000. About 6,000 tons of material will be required. The bridge plans, as prepared, will shortly be approved by the government.

The plant of Grant C. Nobbs has been removed from 2625 Penn Av. to 2529 and 2522 Smallman St., Pittsburg, where more commodious quarters have been secured. Mr. Nobbs has purchased additional property adjoining his plant and will erect an addition within a few months. The product of the plant consists of steel stacks, exhaust pipes, tanks and general jobbing work for mills.

The Hickman Melhorn Co., manufacturers of combination vise and pipe threading machinery have moved from 200 to 208 Liberty St., to 69, 71 and 73 Carson St., South Side, Pittsburg.

Johnston, Morehouse & Dickey have opened a temporary office at 204 Wood St., Pittsburg, representing the following concerns and carrying a full line of mill supplies: Republic Rubber Co.; American Belting Co., cotton belting; Bickford & Frances Belting Co. After April 1 they will open a supply house at 106 Market St.

N. M. Fraser & Co., Pittsburg, Pa., have purchased the plant and good will operated by J. A. Fleming at 2625 Liberty St. The purchasers will continue the forging business.

The Duquesne Manufacturing Co., of Pittsburg manufacturers of the Gunning feed water heater report recent sales to the following concerns: Singer Mfg. Co., South Bend, Ind.; Frick Building, Pittsburg, six; two to the Henry Hotel, Pittsburg, and a number to the Studebaker Bros. Mfg. Co., South Bend, Ind.

Samuel D. Miller, Jr., who for several years was connected with the stores of the Oil Well Supply Co., of Pittsburg, has associated himself with V. Q. Hickman, dealer in second hand supplies. He will act in the capacity of manager of the concern.

General Industrial Notes:—

Cochran & Crawford's new foundry at Sterling, Ill., was placed in operation last week and the first heat was successfully poured. The foundry will do jobbing work almost entirely.

Interests connected with the Empire Iron & Steel Co. have purchased the well known Oriskany ore properties known as Wilson Run, together with the blast furnace located at Iron Gate, Va. This property has been operated for some time under the name of the Allegheny Iron & Steel Co. Possession is to be taken shortly upon the expiration of the lease of the property to M. D. Chapman, of New York. It is also reported on reliable authority that a new corporation is being organized to be known as the Oriskany Ore & Iron Co. and that the Victoria and Shenandoah furnaces, together with the Potts Valley Iron Co., will be taken over. By taking over these properties the new company will have three furnaces together with about 30,000 acres of ore land in Virginia. It is probable that Charles H. Zehnder, late president of the Dickson Mfg. Co., of Scranton, Pa., will be made president and M. T. Cox, of Robert Winthrop & Co., 40 Wall St., N. Y., will be made treasurer. The management of the properties will be entrusted to W. W. Taylor.

The capital stock of the Reading Foundry Co., Reading, Pa., has been increased from $10,000 to $300,000.

At the annual meeting of the stockholders of the Wheeling Steel & Iron Co., Wheeling, W. Va., directors for the ensuing year were elected as follows: C. R. Hubbard, W. F. Stifel, A. J. Clark, H. H. Hornbrook, George Wise, George K. Wheat, W. A. Isett, J. D. Dubois and Edward Hazlett.

At a recent meeting of the directors of the Youngstown Steel Casting Co., Youngstown, O., an increase in the capital stock from $50,000 to $100,000 was authorized.

William McIntyre & Sons, Sharon, Pa., has been awarded the contract for the erection of five open-hearth furnaces, 12 gas producers, and 6 annealing furnaces for the American Steel Casting Co. at Alliance, O.

The Falcon skelp mill at Niles, O., which has been idle for the past two years, will be placed in operation shortly on sheet bars. Two furnaces at that plant are being rebuilt.

The Snead, Van Alstine Meldrum Co., of Louisville, Ky., has been reorganized under the name of the Snead Architectural Iron Works. The officers of the reorganized company are Bernard Seligman, president; Thomas S. Snead, secretary and treasurer. The capital stock of the company is $50,000.

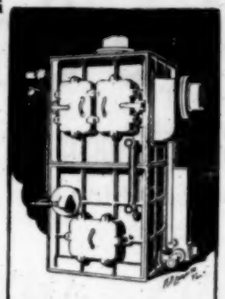
The Youngstown Iron Sheet & Tube Co., Youngstown, O., last week acquired 40 acres of land at Struthers, where the company's new plant is under erection. The land acquired is west of the furnace of the Struthers Furnace Co., and is opposite the iron, sheet and tube mill. The property has been purchased to afford adequate room for extensions to the plant which will be made from time to time. The newly acquired property gives the company 172 acres of land at Struthers. The sheet bar and sheet mills of the new plant were placed in operation this week and are operating very successfully. The puddle furnaces will be put on double turn shortly.

The Lloyd-Booth department of the United Engineering & Foundry Co., Youngstown, O., has just completed one of the largest shears ever built for the Cambria Steel Co., Johnstown, Pa. An order for another pair has just been placed by the LaBelle Iron Works of Steubenville, O. The shears complete weigh 95 tons, the intensifiers in themselves weighing 65 tons. The steam cylinder on the intensifier is 5 feet 5 inches in diameter, that of the motor cylinder being 10 inches. The stroke is 8 feet. The shears will cut 42-inch slabs and were designed by Julian Kennedy, of Pittsburg.

No. 3 furnace of the Woodstock Iron Co., Anniston, Ala., has been blown out and will be completely overhauled as well as enlarged during the next six months. The capacity of the furnace is to be increased from 200 to 300 tons daily. The Walsh & Whitten Foundry Co., of Chattanooga, and the Caldwell-Watson Foundry Co., of Birmingham, Ala., will repair and enlarge the stack.

The Cahall Sales Department of the Aultman-Taylor Co., of Mansfield, O., has been awarded the contract for eight Cahall boilers by the Knoxville Iron Co., of Knoxville, Tenn.

M. I. Wilcox, of the Vulcan Iron Works, of Toledo, O., disposed of his interest in that concern to Alex. Backus, last week.



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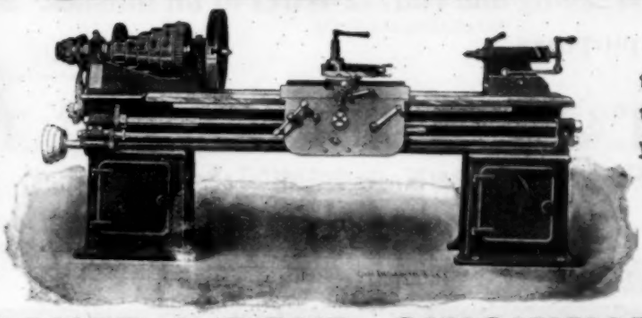

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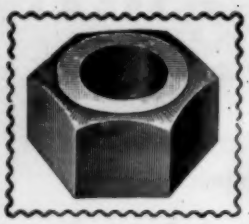

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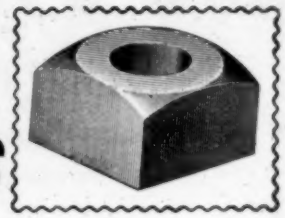

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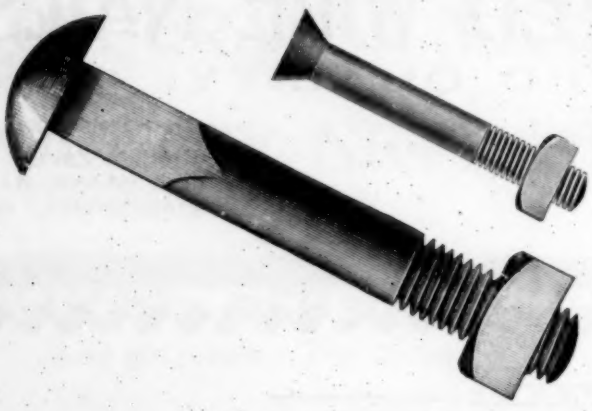

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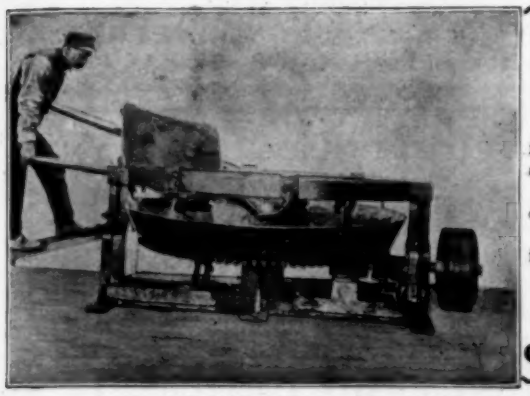

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